

# Process Control Engineering

**Camille Bauer**

**Heavy current engineering**

**Angular position engineering**

**Process control engineering**



 **CAMILLE BAUER**  
Rely on us.

# Die Camille Bauer

## Process Control Engineering at a glance

Only the best have always been working for us, i.e. our customers and the market with all of its changing and new challenges. This implies a permanent learning aptitude which is consistently implemented in our products - particularly in customised solutions. And this world-wide, always considering local requirements, conditions and regulations. We launch new products as announced. We adhere strictly to confirmed delivery dates. And: Our responsibility in relation to customers does not end upon the conclusion of a sale. Systematic and innovative thinking determines our actions. The concept of all product groups is comprehensive and integrative. In this respect, high priority is given to the interaction of hardware and software.

Our program may be subdivided as follows:

- **Heavy current engineering**
- **Angular position engineering**
- **Process control engineering**

Camille Bauer offers two options for orders: The versatile products of Camille Bauer have different product features. You can obtain products via Order Code or as stock versions.

The Order Code is stated on the data sheets on our homepage:

[www.camillebauer.com](http://www.camillebauer.com).

For standard applications, use the 6-digit Article Number stated in this catalogue. These products are on stock and can be supplied within 3 days.

It is a matter of course that our competent sales partners in your country will support you in ordering (please see the inside of the rear cover or visit our homepage).

Our in-house area sales manager will support you in countries which are not listed.

**Heavy current engineering**

**Angular position engineering**

**Process control engineering**

**Basics**


**Passive signal converters without power supply (2 wire)**

**Active signal converters with power supply (4 wire)**

**Multifunctional signal converters high-performance, universal transmitter**

**Process management**

**Software and accessories**

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Rely on us:  
We provide a  
3-year warranty for all  
Camille Bauer products.

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## Galvanic isolation

Despite the continually increasing level of automation and the proliferation of fieldbus systems in process automation, signal converters are still indispensable. They essentially perform 3 main tasks: Signal conversion, galvanic isolation of signals and the amplification of signals. In addition, some signal converters can supply 2-wire transmitters.

Two distinct systems are available: Passive signal converters designed in the so-called 2-wire technology which obtain their energy directly from the measuring circuit and active signal converters, e.g. isolation amplifiers, which are equipped with a special power supply connection. Galvanic isolation of the individual "circuits" is of great significance. Camille Bauer signal converters typically feature galvanic 3-way isolation which completely decouples the input, output and power supply circuit.

### Galvanic isolation

Galvanic isolation (also referred to as decoupling) generally describes the electric isolation of two power circuits. Charge carriers cannot flow from one circuit to another since there is no conductive connection between the circuits. However, electric power or signals may be transmitted between the circuits via corresponding coupling elements.

A typical example for galvanic isolation is a simple transformer with a primary and secondary winding. Both windings are completely separated from each other. The energy is transmitted by electromagnetic fields. Camille Bauer uses different methods for galvanic separation, e.g. optical couplers.

### Signal converters with power supply

(Active signal converters / 4-wire technology) These signal converters are equipped with a power supply which is galvanically isolated from

the measuring circuit. Depending on the design, these signal converters are frequently not only used as potential isolators but also as signal converters or amplifiers. See Figure 1.

**Signal converters without power supply** (passive signal converters / 2-wire technology) Potential isolation or measuring signal conversion does not always demand active signal converters – signal converters without power supply can be employed frequently without any limitation. In this case, the energy is supplied from the voltage drop at the input terminals of

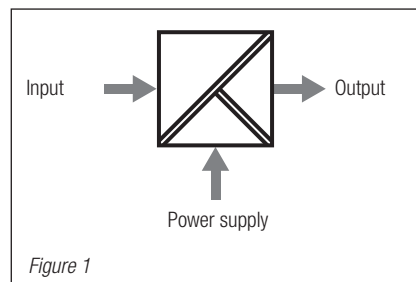


Figure 1

the passive signal converter. However, the appropriateness for the respective application is to be examined taking the power rating of the input signal and the output burden into consideration. Signal converters without power supply do not enable signal amplification and do not work free of reaction, i.e. the output burden bears directly on the input signal.

For an example see Figure 2: A transmitter with a 0...20 mA signal at the input of a passive signal converter can carry a maximum of 18 V ( $I_E = 0...20\text{ mA}$ ,  $U_{E\text{ max}} = 18\text{ V}$ ). The voltage drop or internal voltage consumption  $U_{int}$  of the signal converter is stated to be 2.8 V. This results in  $U_E = U_{int} + (I_A \times R_B)$  the maximum output:  $R_{B\text{ max}} = (U_{E\text{ max}} - U_{int}) / 20\text{ mA} = 760\ \Omega$ .

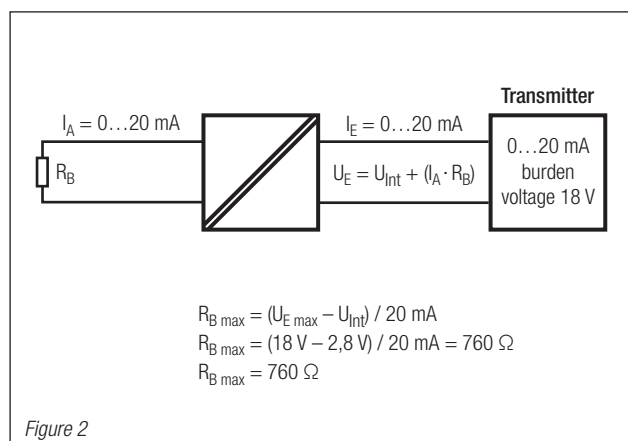


Figure 2

## Main tasks of signal converters

### Signal conversion

An input signal is converted into an output signal. Numerous applications require this feature. For example, resistance or voltage values of temperature sensors are converted into standardised current signals, e.g. 4...20 mA or 0...20 mA. Adaptations from 4...20 mA to 0...20 mA or to voltage signals are also quite common. In addition, input curves often have to be adapted, linearised or inverted. (Figure 3).

### Signal isolation

Input and output signals are galvanically isolated from each other. This avoids parasitic voltages by potential differences, ensures plant safety and protects persons. Galvanic isolation thus safeguards personal security when voltages with dangerously high potentials are measured. Despite the fact that a measuring signal may only amount to a few mV, the potential against earth and thus against persons is dangerously high in case

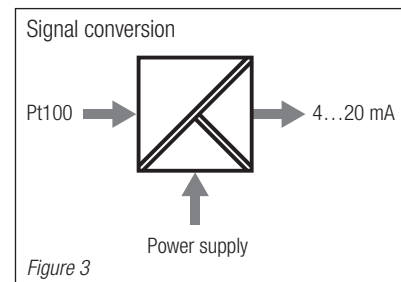


Figure 3

of a failure. This is referred to as the working voltage. Figure 4 shows the example of 10 mV measurement on a working voltage of 100 V.

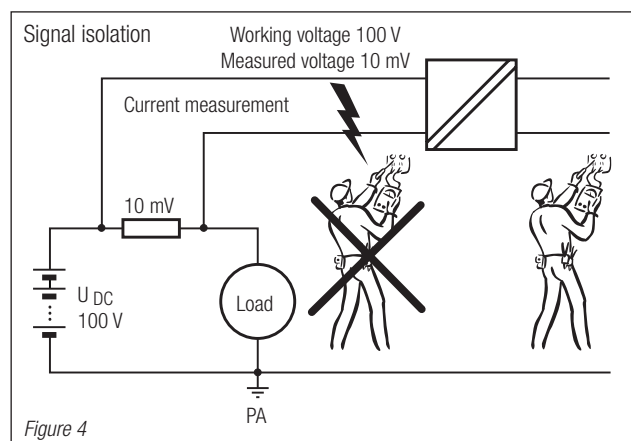


Figure 4

### Signal amplification

This function is reserved for active signal converters since a separate power supply is needed. It mainly concerns applications requiring bridging of long signal paths and the avoidance of interferences

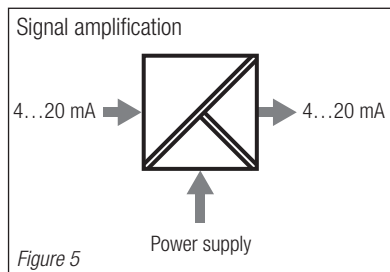


Figure 5



## Explosion protection through intrinsic safety

Camille Bauer I&C instruments for the acquisition of signals in potentially explosive atmospheres are designed to comply with the explosion protection category "intrinsically safe". Intrinsically safe electrical circuits are incapable of igniting potentially explosive atmospheres either by means of sparking or thermal effect under the fault conditions specified below. To this end, the electrical energy of the circuit is restricted by voltage and current limiters. The term intrinsic safety is generally abbreviated to the letter „i“.

### Categories ia and ib

Electrical circuits do not cause ignition during normal operation:

ia	If a single fault or a combination of any two faults occurs
ib	If a single fault occurs

### Zones and Gases

The zones in which potentially explosive atmospheres occur are classified as follows:

Zone 0	Gas is present continuously or for long periods
Zone 1	Gas is likely to occur
Zone 2	Gas is seldom present and only for short periods of time

The large number of various gases are categorised into explosion groups IIA, IIB and IIC. The danger of explosion is greatest for Category IIC.

### Intrinsically safe equipment

- All circuits are intrinsically safe
- Installation within the explosion hazard area

Marking and Electrical Data, e.g.: EEx ia IIC T6

EEx	Complies with EN 50...
ia	Type of protection
IIC	Explosion group
T6	Temperature class

$U_i$	Max. permissible input voltage
$I_i$	Max. permissible input current
$P_i$	Max. permissible input power
$C_i$	Internal capacitance
$L_i$	Internal inductance

The temperature class indicates the max. surface temperature of the apparatus:

T1	450 °C	T4	135 °C
T2	300 °C	T5	100 °C
T3	200 °C	T6	85 °C

The lowest ignition temperature of the potentially explosive atmosphere must be greater than the max. surface temperature.

### Associated Electrical Apparatus

- Electrical circuits are intrinsically safe and non intrinsically safe
- Installation outside of the potentially explosive atmosphere

Marking and Electrical Data, e.g.: [EEx ia] IIC

[ ]	Associated electrical apparatus
EEx	Complies with EN 50...
ia	Type of protection
IIC	Explosion group

$U_o$	Max. output voltage
$I_o$	Max. output current
$P_o$	Max. output power
$C_o$	Max. permissible external capacitance
$L_o$	Max. permissible external inductance

The manufacturer, the device type, the  $\text{Ex}$  mark and the test number from the testing authority are affixed to both apparatus types.

### Guideline RL 94/9/EG / ATEX

This guideline has been in effect since 1.7.2003. The most important part is the conformity evaluation procedure.

This requires that a manufacturer classifies his Ex device into one of three categories, which is then assigned to a zone. Depending on the category, various QA measures must be implemented for the manufacture of explosion protected devices. E.G., Category 1 requires QS production. The ref. number of the notified body (NB) is located next to the CE mark. The group, category and letter G (gas) or D (dust) explosion protection must appear next to the Ex mark on the label.

Marking with Type Examination Certificate: PTB 97 ATEX 2074 X

97	Year of approval
ATEX	EC guideline
2074	Test laboratory no
X	Special condition(s)

Marking:  $\text{Ex}$  II (1) G  $\text{CE}$  0102

$\text{Ex}$	Identification of Ex protection
II	Group
(1)	Category, with ( ) = associated, without ( ) = intrinsically safe equipment
G	G = Gas explosion protection D = Dust-Ex
0102	NB number (production monitoring body) 0102 = PTB

The CAMILLE BAUER AG product range is designed for Zone 1. Explosion Group IIC. It is thus permissible to use them in zone 2 and also as Group IIB or IIA devices. All Category ia devices with electrical insulation and Category 1 devices conforming to Guideline 94/9/EC fulfil the requirements for Zone 0. Note, however, that Category 1 is only one of the conditions required for Zone 0.

### Installation according to EN 60 079-14

Additional specifications for intrinsic safety are given in Section 12 of EN 60 079-14 which is in force as VDE 0165 in Germany. Most importantly, this standard sets forth installation rules for Zones 1 and 2, supplementary precautions for Zone 0 and the wiring requirements for and verification of intrinsic safety. The following applies where active and passive devices are interconnected:

$$U_i \geq U_o \text{ and } I_i \geq I_o \text{ and } P_i \geq P_o$$

Providing the circuit does not include energy storing components, the cable length is determined on the basis of its C and L values. The maximum permissible cable length is given by  $C_o - C_i$  and  $L_o - L_i$  and the specific C and L of the cable.



## Intrinsic safety in temperature measurement

Temperature is the most frequently measured physical variable. The market thus offers numerous applications and instruments in this respect. For temperature measurements in partly closed processes, sheathed thermometers are mainly used. A sheathed thermometer contains a head transmitter which transforms the sensor signal into a mA norm signal. Different instrument designs are used in hazardous areas.

The Camille Bauer instruments for hazardous areas are designed for simple applications through to those with fieldbus connection. Different instrument versions are available. On the one hand, these are 2-wire transmitters for top-hat rail installation and, on the other hand, head transmitters with the options of galvanic isolation, programming functions (also HART programming) and fieldbus connection (FISCO). Outside of hazardous areas, temperature transmitters with or without programming or online analysis are used.

$U_i \geq U_o$ ,  $I_i \geq I_o$  and  $P_i \geq P_o$  generally applies to the proof of intrinsic safety. The „i“ stands for input and refers to the passive equipment. The „o“ stands for output and characterises the active equipment.  $L_i$ - and  $C_i$ -data – together with  $L_o$ - and  $C_o$ -values as well as the capacitance or inductivity of the cable ( $C_k$ ,  $L_k$ ) – defines the maximum installation length of the connecting lead. Length  $l$  is calculated as follows:

$$l = C / C_k \text{ with } C = C_o - C_i.$$

The same is analogously applicable to inductance values in which the capacitance values mostly determine the length of the lead. These values are stated in the respective type-examination certificate or the data sheet.

### Certified sensors:

#### The manufacturer is responsible.

The type-examination certificate states  $U_i$ ,  $I_i$ ,  $P_i$ ,  $C_i$  and  $L_i$  data as well as the temperature class and the gas group of passive sensors. If one of the  $U$ ,  $I$  or  $P$  values is missing, any value may usually be used. If a  $C$  or  $L$  value is missing, the same has to be taken as  $\sim 0$ . The length should be calculated, on principle, even though the connecting leads are short in the sensor tube.

Head transmitter (Connection for power supply unit)	Power supply unit
$U_i = 30 \text{ V}$	$U_o = 21 \text{ V}$
$I_i = 160 \text{ mA}$	$I_o = 75 \text{ mA}$
$P_i \text{ max. } 1 \text{ W}$	$P_o = 660 \text{ mW}$
$L_i, C_i \sim 0$	$C_o = 178 \text{ nF}$ $L_o = 6.7 \text{ mH}$

Table 1. Specimen parameters for the connection of the head transmitter to a power supply unit.

### Non-approved sensors:

#### The user is responsible

In relation to standards, temperature sensors are so-called low-end intrinsically safe equipment and certificates are not obligatory (Zones 1, 2). Users can calculate themselves the maximum ambient temperature permitted using technical characteristic values (thermic resistance) and the classification into a suitable temperature class according to EN 60 079-14 Section 12.2.5. In addition, there is the classification into a gas group as well as the evaluation of the housing and the separating distances. In view of these requirements, the evaluation should be performed by a skilled person.

### Connection to the power supply unit

As the head transmitter is connected to the power supply unit, the transmitter is passive and the power supply unit active for the proof of intrinsic safety. Table 1 contains an example.

The calculation of the maximum length of the lead between both instruments shows that with

$C_o = 178 \text{ nF}$  considerably more capacitance is available than usual. To achieve this, a small  $U_o$  was endeavoured during development. The head transmitter does not have any  $C_i$  either which is intended in order to have the  $178 \text{ nF}$  completely available for the connecting lead. In standard leads with  $120 \text{ nF/km}$ , a maximum length of  $l = 1.483 \text{ km}$  results. A calculation based on  $L_o$  permits an even longer cable; however, the lower of the two values is applicable.

### Field programming:

#### Permitted or not?

In transmitter programming, an additional wattage entry by laptop or PC is effected in most cases. The Ex data of the head transmitter may be influenced in programming depending on the design. The devices take this additional wattage into consideration in the type-examination certificate. For example, (re)programming of a running facility (sensor in the Ex area) is possible if a fire permit is available.

### Galvanic isolation solves the problem of double earthing

One selection criterion is the galvanic isolation between the supply and sensor connection. Particularly in Ex devices it is recommended to use galvanically isolated instruments in order to prevent possible earthing problems. If the measuring circuit is earthed in welded sensors, the supply circuit must not be earthed in low-end devices without galvanic isolation.

### HART terminal: Connection permitted?

Transmitters may easily be programmed or read in the field using the HART protocol. The required handheld terminal should be connected to the non-Ex circuit or the provided connection of the power supply unit. However, if users must connect the handheld terminal (in the Ex-i type of protection) to the intrinsically safe circuit, e.g. in trouble shooting this is not possible without prior calculation. In relation to intrinsic safety, the handheld terminal is active equipment, has a type-examination certificate and additionally feeds - in the most adverse case - a second wattage into the Ex-i circuit. This is called an interconnection of two active equipment items whose proof of intrinsic safety is detailed in EN 60 079-14 (Section 12.2.5.2. incl.



Figure 1. Ex-i proof for HART programming in the certificate.

equipment, has a type-examination certificate and additionally feeds – in the most adverse case – a second wattage into the Ex-i circuit. This is called an interconnection of two active equipment items whose proof of intrinsic safety is detailed in EN 60 079-14 (Section 12.2.5.2. incl. Attachment B). However, the figure „Parallel connection - current addition“ in Attachment B is only applicable to this case if the power supply unit and the handheld terminal have linear output characteristics. If one of the two characteristics is not linear, the proof must be provided on basis of the THEx-10 PTB report. To avoid this work, users are well advised to employ a power supply unit as shown in Figure 1 in which the manufacturer has already taken the connection of a handheld terminal into consideration in the certificate.

### FISCO: Fieldbus Intrinsically Safe Concept

The connection of a transmitter to an intrinsically safe bus is easy if all components of the bus system correspond to the FISCO model. If the devices used (a power source, maximum 32 bus devices, two terminating resistors) and leads as well as the interconnection have been designed in accordance with FISCO specifications, the system is considered to be adequately safe. The safety documentation is reduced to listing the equipment used and the certificates. The requirements of the transmitter may be derived from the power sources. The maximum data of these so-called segment couplers are:  $I_0 = 380 \text{ mA}$ ,  $P_0 = 5.32 \text{ W}$  and  $U_0 = 17.5 \text{ V}$ . These values are considerably above those of 2-wire technology. Development departments face great challenges

if both conventional and bus-compatible head transmitters are to be implemented in the same types of housing. As  $C_i$  maximum 5 nF, as  $L_i$  maximum 10 mH are permitted, and the devices must be classified in Group IIC and Temperature Class T4.

### Alternatives to head transmitters

Head transmitters are often exposed to high temperatures because of their assembly in the immediate vicinity of processes which reduces the useful life of these devices. Users can exclude this disadvantage if they employ a transmitter for rail assembly in hazardous areas. These products are hardly bigger than a terminal which is

usually installed in the subdistribution system any way (Figure 2). Top-hat rail adapters for head transmitters have also been developed but they require considerably more space.

### Temperature transmitters outside of Ex areas

Temperatures may also be measured in the cabinet using compensating cables. Intrinsic safety is again proven by a comparison of U, I and P data. The length of the lead is calculated on basis of C or L parameters, too. Programmable devices ensure that additional programming output does not have any influence on intrinsic safety. Furthermore, the devices can be programmed without a connection to a separate power supply.



Figure 2. „Intelligent terminal“ in the field instead of a transmitter increases packing density.

## Electromagnetic compatibility

### What is it all about?

Electromagnetic compatibility (EMC) signifies that electrical and electronic products work safely at their place of use. To safeguard this, the interfering emission of electromagnetic signals of devices, systems or plants must be limited. On the other hand, it must also be safeguarded that devices, systems or plants are not impaired by the interfering signals present in their environment. These relatively simple facts are stipulated in the EMC Directive 89/336/EC and can only be achieved if all those involved play the game. All manufacturers are obliged to test their products accordingly or have them tested.

The CE-mark is the basic precondition that a product may be put into circulation in Europe. In this way, manufacturers confirm that their products conform to applicable directives for their type of product. The EMC directive is an integral part of this requirement profile. Outside of Europe, other identification obligations are partly applicable. These are now harmonised to such an extent that also in relation to EMC comparable requirements can be assumed.

### The problem

The increase of electrical and electronic products in the industrial environment but also in products of daily use is still immense. More and more functionality with even higher performance is implemented in these products. Processor systems with increasingly higher clock frequencies are

being used. They generate higher and higher levels of interference unintentionally and also become more and more sensitive to interfering sources in their environment.

To make matter worse, the applications using radio frequencies are also increasing. For example, mobile telephones must be in a position of sending and receiving signals. Though their transmission output is limited, incompatibilities might result if they are used inconsiderately in the vicinity of sensitive devices. Systems may be interfered with to such an extent that they provide wrong signals or break down completely. This is the reason, why their use is often limited, e.g. in aircrafts or also in hospitals where sensitive medical devices might be affected. The awareness of EMC problems in aircrafts has been established over years but must still be pointed out to passengers prior to every take-off. When entering a hospital hardly anybody turns of his or her mobile telephone despite warning messages on the walls. Operational managers of power plants are often not aware of the fact that the use of mobile telephones in the vicinity of measuring, controlling and regulating units can be critical. Radio and television stations, mobile radio antennae or remote controls also work with frequencies which might interfere with sensitive devices and impair their operation.

### Sources of interference

In the industrial environment, frequency converters, motors and other consumers are increasingly operated parallel to sensitive

measuring and control systems. Higher levels of interference must generally be expected in all places where high power is applied, switched or pulsed or electronic systems with high pulse frequencies are used.

The use of wireless telecommunication facilities or networks also increases the probability of incompatible levels of interference in the environment of sensitive equipment.

### Standards

Applicable specific basic standards define the requirements of products and systems for use in their original environment. A limited number of tests with evaluation criteria and the expected operating behaviour are determined using defined measuring and test procedures. Specific basic standards contain details of the measuring method and general conditions. Specific EMC standards are available for certain products or product groups and have priority over the general requirements mentioned above.

EMC safety can only be achieved by a complete examination in accordance with standards. Since all standards are interrelated only their sum total provides a satisfactory result. Partial examination is not permitted, however still done by some manufacturers due to lacking measuring equipment or for reasons of costs.

Meeting standards does not necessarily provide smooth operation. A device may be subjected to higher loads in operation than envisaged by the standard. This might be caused by insufficient protection of the equipment or by EMC-incompatible wiring. In such a case, the behaviour of the device is largely undefined since it has not been tested.

### Tests at Camille Bauer

Camille Bauer has its own EMC laboratory where the complete scope of all required tests (see below) can be performed. Even if our laboratory is not accredited, comparative measurements at the premises of respective service providers as well as subsequent checks by customers confirmed our test results in each case.

We also test our devices under higher loads than demanded by the standard even if this is not explicitly stated in our data sheets.

### Specific basic standards

IEC / EN 61 000-6-2

Immunity standard for industrial environments

IEC / EN 61 000-6-4

Emission standard for industrial environments



Measurement of the behaviour of the devices in voltage dips, brief interruptions or voltage fluctuations of the power supply

### Basic standards

#### *IEC / EN 61 000-4-2*

Immunity to static discharge which occurs as potential differences – mainly caused by friction electricity – are reduced. The most known effect is surely when persons get charged as they walk across a carpet and discharged with the generation of a spark when they touch a metal part. If this is, e.g., the plug of an electronic device the brief current impulse might be sufficient to destroy the device.

#### *IEC / EN 61 000-4-3*

Immunity to high-frequency electromagnetic fields. Typical sources of interference are radiotelephones used by the operating, maintenance or service staff, mobile telephones and transmitting facilities needing these fields. Coupling happens via the air. Unintentional fields also occur in welding facilities, thyristor-controlled inverters or fluorescent lamps.

Coupling might as well be generated via the line in such cases.

#### *IEC / EN 61 000-4-4*

Immunity to fast transient interference variables (bursts) which are generated in switching operations (interruption of inductive loads or bouncing of relay contacts)..

#### *IEC / EN 61 000-4-5*

Immunity to impulse voltages (surges) which are generated in switching operations or lightning and arrive at the device via the connecting lines.

#### *IEC / EN 61 000-4-6*

Immunity to conducted disturbances, induced by high-frequency fields which are typically generated by radio transmission facilities. Coupling takes place via the connecting line of the device. For further sources of interference see 61000-4-3.

#### *IEC / EN 61 000-4-8*

Immunity to magnetic fields with power frequencies. Strong magnetic fields result, e.g., in the immediate vicinity of power lines or bus bars.

#### *IEC / EN 61 000-4-11*

Immunity to voltage dips, brief interruptions and voltage fluctuations. Dips and brief interruptions of the supply voltage result from errors in the supply system or when large loads are switched. Voltage fluctuations are caused by fast-changing loads, e.g. in arc furnaces, and also generate flickering.



Determination of device behaviour under the influence of a magnetic external field generated by a Helmholtz coil

## Basics controllers and control systems

These controllers and control systems are professional tools for optimized, top quality control performance. Their compact design and universal adaptability make them an ideal companion for worldwide use. All relevant control process data are recorded in close to real-time using options created especially for the controllers, allowing for detailed disturbance analysis. User-friendly tools for initial start-up, remote diagnosis and remote maintenance support and simplify all tasks performed in actual practice. Their diverse functions and expandability make them truly multi-talented control instruments.

### Filter and functions with disturbed control variables

#### Peak filter

Individual erroneous measurements caused by, for example, electrostatic discharge to the sensor, are suppressed.

#### Smoothing filter

In accordance with controlled system dynamics, several measured values are combined for control purposes to avoid an unsteady controlled variable.

#### Actual value correction, Actual value factor

Linear correction of measured values, if, amongst other factors, measured temperature deviates from the temperature to be mea-

sured / to be displayed due to a temperature gradient.

#### Adaptive measured value correction

Suppression of constant periodic or slowly changing oscillation.

#### Oscillation disabling

Suppression of oscillation with a constant period. (Oscillation period 3...200 clock cycles)

#### Feed-forward control

Suppression of controlled variable swells and dips in the event of load fluctuations, e.g. caused by operation/standstill of a machine / system

#### Response in event of sensor failure, sensor error manipulating factor

If operation must be continued with a defective sensor, the controller reads out a plausible manipulated variable in order to maintain the working level.

### Functions

#### Two-Step Controllers

Two-step controllers trigger actuators in two steps, in both cases through the use of ON and OFF signals. As part of this process, the control



algorithm assures that the actual value approaches the setpoint without overshooting.

#### Three-Step Controller

Three-step controllers are utilized when controlling the process necessitates the use of three switching conditions. Some processes require heating, as well as cooling from time to time. Thus three switching conditions are possible: HEAT, OFF and COOL.

#### Three-Step Step-Action Controllers

Three-step step-action controllers are used when controlling a process necessitates a continuous volumetric flow rate. Discontinuous step-action actuators cannot be used in this case: motor actuated valves with an infinite setting range are required instead. Travel to all valve



positions, and thus any desired manipulating factor, is possible with the OPEN, STANDSTILL and CLOSE signals.

### *Continuous-Action Controllers*

Continuous action controllers are used when a continuous control variable is required for controlling the process. The output signal is either a direct current (0/4 to 20 mA) or a direct voltage (0/2 to 10 V). Actuators manipulated by these signals are usually thyristor power controllers or RPM controllers.

### *Hot-Runner Controllers*

Extremely compact hygroscopic cartridge heaters are used for injection moulds, which are made of a material which absorbs moisture when cooled down. Heat-up must take place slowly in order to avoid converting absorbed moisture into steam and damaging the cartridge heater. Hot-runner controllers are equipped with a startup ramp and provide a very fast switching, reduced actuator signal, thus preventing vapor build-up. After the heat-up process has been completed, the controller performs just like a normal two-step controller.

### *Fixed Value Control*

The setpoint is permanently set to a constant value at the controller in the case of fixed value control. Fixed setpoint controllers are used to correct interference, and are thus laid out for good interference performance.

### *Follow-Up Control*

The setpoint is specified at the controller by external devices in the case of follow-up control (e.g. as a linear current signal within a range of 4 to 20 mA). The follow-up controller is assigned

the task of readjusting a physical quantity in accordance with a continuously changing setpoint.

### *Ratio Control*

Ratio control is a special type of follow-up control. It is used to keep the specified ratio between two process quantities constant. The desired ratio is set at the controller.

### *Differential Control*

The differential setpoint of two process quantities is adjusted to a fixed value, which is selected at the controller, by means of differential control.

### *Cascade Control*

Control performance can be significantly improved for difficult to control processes with cascade control. Two controllers are usually required to this end: one master controller and one follow-up (or slave) controller. This type of system is characterized by the fact that the output quantity of the master controller is the command variable for the follow-up controller.

### *Program Control*

With program controllers, the setpoint is selected automatically according to a time profile which has been saved to the controller. Several profiles can be saved.

### *Setpoint 2*

Energy is saved during production breaks with the use of a reduced setpoint value. Setpoint 2 is activated by means of an internal, or an external signal.

### *Setpoint Ramp*

Gentle heat-up or cool-down is made possible for temperature sensitive materials by selecting an appropriate gradient. The selected gradient determines the rate of temperature change until the setpoint value is reached.

### *Heating Circuit Monitoring*

The heating circuit function is monitored without any additional hardware. After switching the heat on, the controller detects temperature rise and compares it with anticipated change based upon control parameters. Excessive deviation is indicated.

### *Heating Current Monitoring*

A current transformer is installed in order to monitor the function of the heating circuit. After switching the heat on, the controller acquires heating current and compares it with the selected current setpoint value. Deviation is indicated.

### *pH Control*







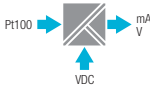
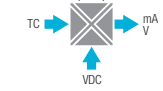
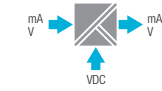
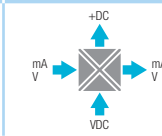
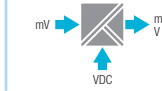
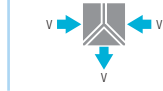






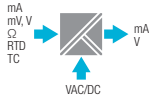
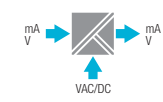
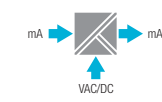
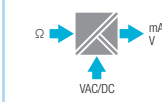
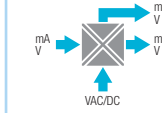
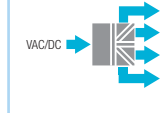








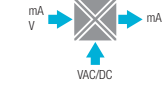
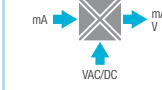

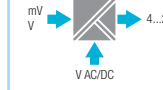
The pH value is a measure of the strength of the acidic or alkaline action of an aqueous solution. The term itself is derived from the Latin *pondus hydrogenii*: *pondus* means weight and *hydrogenium* means hydrogen. The pH value is one of the most important chemical quantities. Its ascertainment and control are standard in many industrial applications including wastewater treatment and quality control for liquids. The desired pH value of a liquid can be precisely adjusted by influencing the concentration of acids and leaching agents. If a liquid needs to be neutralized, especially great demands are placed upon the reliability and the accuracy of the regulating process. The greatest challenges of pH value control include the unusually large measuring range which encompasses 14 powers of ten, and the long "dead time".



Overview passive signal converters






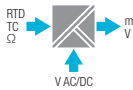
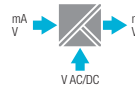
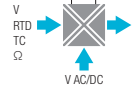
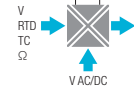
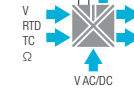
	<b>VK615</b>	<b>VK616</b>	<b>VK626</b>	<b>VK637</b>	<b>V608</b>	<b>V610</b>
						
	Head transmitter	Programmable head transmitter	Head transmitter with HART protocol	Head transmitter with Profibus interface	Programmable temperature transmitter	Temperature transmitter for Pt100
						
SINEAX	Page 18	Page 18	Page 19	Page 19	Page 20	Page 20
	<b>V611</b>	<b>VH617</b>	<b>VS30</b>	<b>SI815</b>	<b>TI807</b>	<b>TI816</b>
						
	Programmable temperature transmitter	Temperature transmitter with HART protocol	Pt100, Ni100 loop-powered converter	Loop-powered supply unit with HART protocol	One or multichannel passive isolator	Passive signal isolator
						
SINEAX	Page 21	Page 21	Page 22	Page 23	Page 24	Page 24
SIRAX	—	—	—	Page 40	Page 41	—
	<b>TI801</b>	<b>TI802</b>	<b>2I1</b>	<b>DCM 817</b>		
						
	Passive signal isolator, loop-powered	Passive signal isolator, 2-channel, loop-powered	Passive signal isolator	Passive signal isolator module		
						
SINEAX	Page 23	Page 23	Page 25	Page 25		

## Overview active signal converters




	<b>VS40</b>	<b>VS46</b>	<b>VS50</b>	<b>VS52</b>	<b>VS54</b>	<b>VS70</b>
						
	Pt100 converter	Thermocouple converter with alarm unit	Galvanic isolator/ analogue converter	Isolating amplifier with transmitter supply	Current shunt / V-I converter	Power supply for the CB-power-bus
						
SINEAX	Page 28	Page 28	Page 32	Page 32	Page 33	Page 38
	<b>V620/V622</b>	<b>TV810</b>	<b>TV804</b>	<b>TP619</b>	<b>TVD820</b>	<b>B840</b>
						
	Universal converter / isolating amplifier	DC current-voltage isolating amplifier	DC current isolating amplifier	Potentiometric to DC isolating amplifier	DC duplicator / isolating amplifier	4-channel power supply unit
						
SINEAX	Page 29	Page 33	Page 34	Page 34	Page 35	Page 37
	<b>TV819</b>	<b>B812</b>	<b>C402</b>	<b>B811</b>	<b>TV808</b>	<b>TV829</b>
						
	Isolation amplifier	<b>HART</b> Standard power supply unit	Alarm units	<b>HART</b> Power supply unit with add. functions	<b>HART</b> Configurable isolation amplifier	High voltage isolation amplifier
						
SINEAX	Page 30	Page 37	Page 36	Page 36	2 channel: page 30/31	Page 35
SIRAX	—	—	Page 43	Page 41	Page 42/43	—
EURAX	—	—	—	Page 36	—	—



Overview multifunctional signal converters

	V624	TV809	V604	VC603	V604s
					
	Programmable temperature transmitter	Programmable isolation amplifier	Programmable universal transmitter	Programmable combined transmitter / alarm units	Programmable multi-functional transmitter / alarm unit
					
SINEAX	Page 46	Page 47	Page 48	Page 49	Page 50
SIRAX	V606 (2 channel): page 40	—	V644: page 39	—	—
EURAX	—	—	Page 48	Page 49	—

Legend

-  Devices without galvanic isolation
-  Devices with galvanic isolation
- SINEAX** in housings for top-hat rail mounting
- SIRAX** Modules for SIRAX plug-in system
- EURAX** Plug-in cards for 19" assembly rack
-  Compatible with CB-Power-Bus



## Content passive signal converters

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# Camille Bauer

## Passive signal converters

### Head transmitter

with firmly set measuring ranges

#### Customer benefit

- Delivered in calibrated condition
- Manual zero and span calibration
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Pt1000, 2 or 3-wire connection  
 Output: 4...20 mA, 12...30 V

#### Stock variants

Article No.	Description
154 873	0...100 °C, Pt 100, 2 or 3-wire connection
154 881	0...150 °C, Pt 100, 2 or 3-wire connection
154 899	0...200 °C, Pt 100, 2 or 3-wire connection
154 906	-30...+70 °C, Pt 100, 2 or 3-wire connection
154 914	-50...+150 °C, Pt 100, 2 or 3-wire connection

### Programmable head transmitter

with or without galvanic isolation



#### Customer benefit

- Programmable even without power supply connection
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection  
 Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re  
 Output: 4...20 mA, 12...30 V  
 Ø x height: 43 x 16.8 mm (without galvanic isolation)  
 43 x 30.8 mm (with galvanic isolation)

#### Stock variants

Article No.	Description
137 845	Without galv. isolation, non-Ex design, internal cold junction compensation
137 853	Without galv. isolation, Ex design EEx ia IIC T6, int. cold junction compensation
137 861	With galv. isolation, non-Ex design, internal cold junction compensation
137 879	With galv. isolation, Ex design EEx ia IIC T6, int. cold junction compensation

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

### SINEAX VK615



### SINEAX VK616



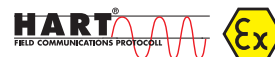
with galvanic isolation

## SINEAX VK626



### Head transmitter with HART protocol

with galvanic isolation



#### Customer benefit

- Programmable via HART protocol
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection  
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re  
Output: 4...20 mA, 12...30 V  
Ø x height: 43 x 30.8 mm

#### Stock variants

Article No.	Description
141 424	Non-Ex design, internal cold junction compensation
141 432	Ex design EEx ia IIC T6, internal cold junction compensation

## SINEAX VK637



### Head transmitter with Profibus interface

with galvanic isolation



#### Customer benefit

- FOUNDATION™ Fieldbus ITK version 4.61
- PROFIBUS® PA profile 3
- Automatic protocol switching

#### Technical data

Input: Resistance thermometers, thermocouples, mV, resistance  
Output: FOUNDATION™ Fieldbus, ITK version 4.61 and  
PROFIBUS® PA EN 50170 vol. 2 / profile 3  
Ø x height: 44 x approx. 20 mm

#### Stock variants

Article No.	Description
163 197	SINEAX VK637

# Camille Bauer

## Passive signal converters

### Programmable temperature transmitter

for top-hat or G-rail assembly, 2-wire



#### Customer benefit

- Programmable even without power supply connection
- Applications in hazardous areas (Zone 1)
- Reverse polarity protected connections
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection  
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re

Output: 4...20 mA, 12...30 V

Height x width x depth: 62 x 17 x 67 mm (incl. top-hat rail)  
62 x 17 x 72 mm (incl. G-rail)

#### Stock variants

Article No.	Description
141 515	Non-Ex design, internal cold junction compensation
141 523	Ex design EEx ia IIC T6, internal cold junction compensation

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

### Temperature transmitter for Pt100

for top-hat or G-rail assembly, 2-wire

#### Customer benefit

- Sensor breakage and short-circuit monitoring
- Narrow design
- Serial mounting without any limitation
- Reverse polarity protected connections

#### Technical data

Input: Pt100 in 3-wire connection

Output: 4...20 mA, 12...30 V

Height x width x depth: 90.2 x 7 x 86 mm (incl. top-hat rail)  
90.2 x 7 x 91 mm (incl. G-rail)

#### Stock variants

Article No.	Description
154 823	0...100 °C
154 831	0...150 °C
154 849	0...200 °C
154 857	-30...+70 °C
154 865	-50...+150 °C

### SINEAX V608



### SINEAX V610



## SINEAX V611



### Programmable temperature transmitter

for top-hat or G-rail assembly, 2-wire

#### Main features

- Narrow design
- Serial mounting without any limitation
- Programmable even without power supply connection
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 as well as other sensor types in 2, 3 or 4-wire connection  
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re

Output: 4...20 mA, 12...30 V

Height x width x depth: 90.2 x 7 x 86 mm (incl. top-hat rail)  
90.2 x 7 x 91 mm (incl. G-rail)

#### Stock variants

Article No.	Description
152 504	Internal cold junction compensation

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

## SINEAX VH617



### Temperature transmitter

for top-hat rail assembly, with galvanic isolation

#### Main features

- User-friendly Configuration Software available free-of-charge
- Signalling in acc. with NAMUR NE 43, NE 89

#### Technical data

Input: Pt10...Pt1000, JPt100, Ni100 and resistance sensor  
Thermocouples type B, E, J, K, L, N, R, S, T, U, mV-sensor

Output: Configurable, 4...20 mA or 20...4 mA, loop-powered

Height x width x depth: 75 x 22.5 x 98.5 mm

#### Stock variants

Article No.	Description
163 204	SINEAX VH617

# Camille Bauer

## Passive signal converters

### Pt100, Ni100 loop powered converter

Signal converter  
Pt100, Ni100 / loop-powered converter

#### Main features

- Measurement conversion 16 bit
- Small dimensions
- Accuracy class 0.1% or 0.1 °C
- Programming via DIP-switch or software

#### Technical data

Input: Pt100 (–200...+ 650 °C), Ni100 (–60...+ 250 °C)  
Output: 4...20 mA or 20...4 mA  
Power supply: 5...30 V DC (2 wire connection)  
Height x width x depth: 93,1 x 6,2 x 102,5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 769	SINEAX VS30

### SINEAX VS30



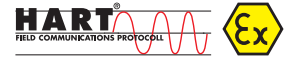


## SINEAX SI815



### Loop powered supply unit with HART protocol

to energise 2-wire transmitters



#### Customer benefit

- No power supply connection required
- HART pass-through
- 1:1 transmission of the 4...20 mA signal
- Suitable for the supply of transmitters in Ex areas

#### Technical data

Input:	4...20 mA, voltage 12...30 V DC
Output:	4...20 mA
	Supply voltage = input voltage – voltage drop
Voltage drop:	2.7 V (without HART and Ex) up to 8.7 V (with HART and Ex)
Height x width x depth:	84.5 x 17.5 x 107.1 mm (N17 housing)
	120 x 17.5 x 146.5 mm (S17 housing)

#### Stock variants (only N17 housing)

Article No.	Description
999 279	Without HART, non-Ex design
999 295	With HART, non-Ex design
999 310	Without HART, Ex design [EEx ia] IIC
999 336	With HART, Ex design [EEx ia] IIC

For the design of the SIRAX plug-in system (SIRAX SI815) see page 40

## SINEAX TI801/802



### Passive Isolator, loop-powered

Passive isolator (loop-powered) mA to mA

#### Customer benefit

- Power supply: self powered from the input (primary) loop
- Channel to channel isolation of 1.5 kV

#### Technical data

Input:	1 or 2 channels, 4...20 mA
Output:	1 or 2 channels, 4...20 mA
Power supply:	Self powered from the input (primary) loop
Height x width x depth:	100 x 17.5 x 112 mm

#### Stock variants

Article No.	Description
162 884	SINEAX TI801 (1 channel)
162 892	SINEAX TI802 (2 channel)

# Camille Bauer

## Passive signal converters

### Passive signal isolator

for the galvanic isolation of 0...20 mA signals, test voltage 500 V

#### Customer benefit

- Current or voltage output for standard signals
- Compact design
- High degree of accuracy

#### Technical data

Input:	0...20 mA
Output:	0...20 mA, 0...10 V
Test voltage:	500 V
Voltage drop:	2.1 V
Height x width x depth:	75 x 12.5 x 49.5 mm (incl. top-hat rail)
	75 x 12.5 x 52 mm (incl. G-rail)

#### Stock variants

Article No.	Description
990 722	Output 0...20 mA
994 089	Output 0...10 V

### One or multichannel passive signal isolator

for the galvanic isolation of 0...20 mA signals, test voltage 4 kV



#### Customer benefit

- Current or voltage output for standard signals
- High degree of accuracy
- Isolates signals for hazardous areas
- Up to 3 channels on a width of 17.5 mm

#### Technical data

Input:	0...20 mA
Output:	0...20 mA, 0...10 V
Test voltage:	4 kV
Voltage drop:	2.8 V (non-Ex design), 4.7 V or 6.3 V (Ex design)
Height x width x depth:	84.5 x 17.5 x 107.1 mm (N17 housing)
	120 x 17.5 x 146.5 mm (S17 housing)

#### Stock variants

Article No.	Housing	Description
999 154	N17	1 channel, input: 0...20 mA, output: 0...20 mA, non-Ex design
999 196	N17	1 channel, input: 0...20 mA in [EEx ib] IIC, output: 0...20 mA
999 170	N17	1 channel, input: 0...20 mA, output: 0...20 mA in [EEx ib] IIC
995 061	S17	2 channels, input: 0...20 mA, output: 0...20 mA, non-Ex design
996 936	S17	3 channels, input: 0...20 mA, output: 0...20 mA, non-Ex design

For the design of the SIRAX plug-in system (SIRAX TI807) see page 41

### SINEAX TI816



### SINEAX TI807



N17



S17

## SINEAX 211



## Passive signal isolator

for the galvanic isolation of 0...20 mA signals, test voltage 4 kV



### Customer benefit

- Isolates signals for hazardous areas
- Robust, tried and tested design
- Exact representation of the current signal

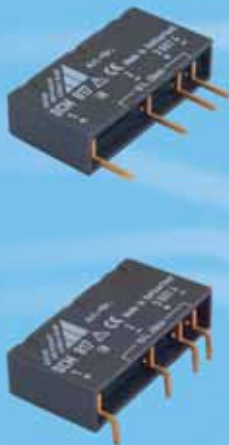
### Technical data

Input:	0...20 mA
Output:	0...20 mA
Test voltage:	4 kV
Voltage drop:	3 V (non-Ex design), 6 V (Ex design)
Height x width x depth:	95 x 24 x 69.5 mm (incl. top-hat rail) 95 x 24 x 74 mm (incl. G-rail)

### Stock variants

Article No.	Description
154 253	Non-Ex design
154 279	Input: 0...20 mA Ex design [EEx ib] IIC
154 287	Output: 0...20 mA Ex design [EEx ia] IIC
154 261	Increased weathering resistance

## DCM 817



## Passive signal isolator module

for the galvanic isolation of 0...20 mA signals

### Customer benefit

- Exact representation of the current signal
- Plug-in or solderable module design
- Space-saving design

### Technical data

Input:	0...20 mA
Output:	0...20 mA
Test voltage:	500 V
Voltage drop:	2.1 V
Height x width x depth:	21 x 41 x 10.3 mm

### Stock variants

Article No.	Description
988 719	Straight connecting pins
988 727	Angled connecting pins



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# Camille Bauer

## Active signal converters

### Pt100 converter

Signal Converter  
Pt100 to DC current / voltage isolator

#### Main features

- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Small dimensions
- Resolution of 14 bit
- Minimal range: 50 °C
- Accuracy class 0.1%

#### Technical data

Input: Pt100 (2-, 3-, 4 wire) (-150...650 °C)  
Output: current 0/4...20 or 20...4/0 mA or  
voltage 0...5/10, 10...0, 1...5 V DC  
Test voltage: 1.5 kV  
Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 751	SINEAX VS40

### Thermocouple converter with alarm unit

Signal Converter  
Thermocouple converter

#### Main features

- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Small dimensions
- Resolution of 14 bit
- Accuracy class 0.1%

#### Technical data

Input: Thermocouples, types: J, K, E, N, S, R, B, T  
Output: current 0/4...20, 20...4/0 mA or voltage 0...5/10, 10...0 and 1...5 V DC,  
Solid State Relay for alarm output  
Test voltage: 1.5 kV  
Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 777	SINEAX VS46

### SINEAX VS40



### SINEAX VS46



### SINEAX V620



### SINEAX V622



## Universal converter/isolating amplifier

Universal converter for mA, V, TC, RTD,  $\Omega$

### Main features

- Isolation: 1500 V AC at 3 ways
- Strobe: Input (control analog output)
- Resolution: Programmable from 11 to 15 bit + sign
- Programmable with Software or CB-Pocket Configurator

### Technical data

Input:	Voltage, current, RTD, TC, NTC, potentiometer, rheostat
Output:	Current 2 ranges 0/4...20 mA Voltage 4 ranges 0/1...5 V, 0/2...10 V
Test voltage:	1.5 kV
Accuracy:	0.1%
Response time:	35 ms (11 bit + sign)
Power supply:	9...40 V DC (V620), 19...28 V AC (V622)
Height x width x depth:	100 x 17.5 x 112 mm

### Stock variants

Article No.	Description
162 834	SINEAX V620, Power supply 9...40 V DC, 19...28 VAC (50...60 Hz)
162 842	SINEAX V622, Power supply 85...265 V AC/DC

## CB-Pocket Configurator



## Portable voltage/current simulator meter

For configuration the SINEAX V620 / V622

### Main features

- Precision class: 0.1%
- Voltage measuring/simulation: 0...10 V
- Current measuring/simulation: 0...20 mA
- High-luminosity OLED display, 128 x 64 points
- Supply by Ni-Mh 2500 mAh rechargeable batteries

Article No.	Description
162 925	CB-Pocket Configurator

# Camille Bauer

## Active signal converters

### Isolation amplifier

for unipolar and bipolar DC currents and voltages

#### Customer benefit

- Standard and non-standard signals
- Safe isolation, enhanced up to 600 V (Cat. II) or 1000 V (Cat. I)
- Manual zero and span calibration

#### Technical data

Input:  $-0.1 \dots +0.1$  mA to  $-40 \dots +40$  mA,  
 $-0.06 \dots +0.06$  V to  $-1000 \dots +1000$  V

Output:  $-1 \dots +1$  mA to  $-20 \dots +20$  mA,  
 $-1 \dots +1$  V to  $-10 \dots +10$  V

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 69.2 x 17.5 x 114 mm (terminals not pluggable)  
 85 x 17.5 x 114 mm (terminals pluggable)

#### Stock variants

Article No.	Description
146 862	Power supply 85–230 V AC/DC, terminals pluggable
146 854	Power supply 24–60 V AC/DC, terminals pluggable
146 846	Power supply 85–230 V AC/DC, terminals not pluggable
146 838	Power supply 24–60 V AC/DC, terminals not pluggable

### Configurable isolation amplifier

for unipolar and bipolar DC currents and voltages



#### Customer benefit

- 36 I/O combinations with jumpers configurable or customised measuring range
- Inputs and outputs for current and voltage in one device
- Intrinsically safe input for signals from hazardous areas
- Manual zero and span calibration

#### Technical data

Input:  $0 \dots 20$  mA,  $4 \dots 20$  mA,  $\pm 20$  mA,  $0 \dots 10$  V,  $2 \dots 10$  V,  $\pm 10$  V or customised

Output:  $0 \dots 20$  mA,  $4 \dots 20$  mA,  $\pm 20$  mA,  $0 \dots 10$  V,  $2 \dots 10$  V,  $\pm 10$  V or customised

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 120 x 17.5 x 146.5 mm

#### Stock variants

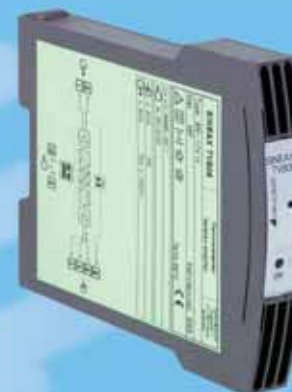
Article No.	Description
124 404	Power supply: 24–60 V AC/DC, 36 combinations freely selectable, not customised
124 412	Power supply: 85–230 V AC/DC, 36 combinations freely selectable, not customised

For the design of the SIRAX plug-in system (SIRAX TV808-61) see page 42

### SINEAX TV819



### SINEAX TV808-11





## SINEAX TV808-115



### Isolation amplifier with HART Protocol

for DC currents and voltages and I/P valve positioner



#### Customer benefit

- Intrinsically safe output for I/P valve positioner in hazardous areas
- HART pass-through
- Unipolar and bipolar inputs, standard or customised signal

#### Technical data

Input:  $-1 \dots +1 \text{ mA}$  to  $-20 \dots +20 \text{ mA}$ ,  
 $-0.06 \dots +0.06 \text{ V}$  to  $-20 \dots +20 \text{ V}$   
 Output:  $0 \dots 20 \text{ mA}$ ,  $4 \dots 20 \text{ mA}$ ,  $20 \dots 0 \text{ mA}$ ,  $20 \dots 4 \text{ mA}$   
 Power supply:  $24 - 60 \text{ V AC/DC}$  or  $85 - 230 \text{ V AC/DC}$   
 Height x width x depth:  $120 \times 17.5 \times 146.5 \text{ mm}$

For the design of the SIRAX plug-in system (SIRAX TV808-615) see page 42

## SINEAX TV808-12



### 2-channel isolation amplifier

for unipolar and bipolar DC currents and voltages

#### Customer benefit

- 2 isolated channels or 1 input/2 outputs in 17.5 mm design width
- Manual zero and span calibration
- 252 I/O combinations with solder bridges configurable or customised measuring range

#### Technical data

Input: Different ranges from  $0.06 \text{ V}$  to  $20 \text{ V}$  or  $0.1 \text{ mA}$  to  $20 \text{ mA}$   
 or customised  
 Output:  $0 \dots 20 \text{ mA}$ ,  $4 \dots 20 \text{ mA}$ ,  $\pm 20 \text{ mA}$  or customised  
 Power supply:  $24 - 60 \text{ V AC/DC}$  or  $85 - 230 \text{ V AC/DC}$   
 Height x width x depth:  $120 \times 17.5 \times 146.5 \text{ mm}$

#### Stock variants

Article No.	Description
128 802	2 channels, input $0 \dots 20 \text{ mA}$ , output $0 \dots 20 \text{ mA}$ , power supply $24 - 60 \text{ V AC/DC}$
128 810	2 channels, input $0 \dots 20 \text{ mA}$ , output $0 \dots 20 \text{ mA}$ , power supply $85 - 230 \text{ V AC/DC}$
128 828	1 input $0 \dots 20 \text{ mA}$ , 2 outputs $0 \dots 20 \text{ mA}$ , power supply $24 - 60 \text{ V AC/DC}$
128 836	1 input $0 \dots 20 \text{ mA}$ , 2 outputs $0 \dots 20 \text{ mA}$ , power supply $85 - 230 \text{ V AC/DC}$

For the design of the SIRAX plug-in system (SIRAX TV808-62) see page 43

# Camille Bauer

## Active signal converters

### Galvanic isolator/analogue converter

DC current / voltage converter

#### Main features

- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Small dimensions
- Resolution of 14 bit
- Accuracy class 0.1%

#### Technical data

Input: Current 0/4...20 mA or  
Voltage 0/1...5, 0/2...10, 0...15/30 V DC

Output: Current 0/4...20, 20...4/0 mA or  
Voltage 0/1...5, 0/2...10 V DC

Test voltage: 1.5 kV

Height x width x depth: 93.1 x 6.2 x 102,5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 785	SINEAX VS50

### Isolating amplifier with transmitter supply

Isolating amplifier  
DC current / Voltage converter (with transducer power supply)

#### Main features

- 3-way galvanic isolation
- Spring-cage clamp connection
- Power bridging terminal DIN rail bus connector
- Small dimensions
- Resolution of 14 bit
- Accuracy class 0.1%

#### Technical data

Input: Current 0/4...20 mA or voltage 0/1...5, 0/2...10 V DC

Output: Current 0/4...20, 20...4/0 mA or voltage 0/1...5, 0/2...10 V DC

Test voltage: 1500 V

Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 793	SINEAX VS52

SINEAX VS50



SINEAX VS52



## SINEAX VS54



### Current shunt/V-I converter

Isolating Amplifier  
Shunt / V-I isolated converter

#### Main features

- 3-way galvanic isolation
- Resolution of 14 bit
- Small dimensions

#### Technical data

Input:  $\pm 25$  to  $\pm 2000$  mV  
 Output: Current 0/4...20, 20...4/0 mA or  
 Voltage 0...5/10, 10...0 and 1...5 V DC  
 Test voltage: 1.5 kV  
 Genauigkeit: 0.1%  
 Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 800	SINEAX VS54

## SINEAX TV810



### DC current-voltage isolating amplifier

Isolating amplifier  
DC-signal converter (current/voltage)

#### Main features

- 3-way galvanic isolation
- Power for 2-wire transducers, 20 V DC

#### Technical data

Input: Current bipolar settable up to 20 mA or voltage  
 Output: Current or voltage  
 Test voltage: 1.5 kV  
 Response time: 35 ms  
 Power supply: 9...40 V DC, 19...28 V AC  
 Height x width x depth: 100 x 17.5 x 112 mm

#### Stock variants

Article No.	Description
162 850	SINEAX TV810

# Camille Bauer

## Active signal converters

### DC current isolating amplifier

Isolating amplifier  
DC current isolator

#### Main features

- 3-way galvanic isolation
- Power for 2-wire transducers, 20 V DC

#### Technical data

Input: Current (active or passive)  
Output: Current (active or passive)  
Test voltage: 500 V  
Response time: 40 ms  
Power supply: 9...40 V DC, 19...28 V AC  
Height x width x depth: 100 x 17.5 x 112 mm

#### Stock variants

Article No.	Description
162 868	SINEAX TV804

### SINEAX TV804



### Potentiometric to DC isolating amplifier

Potentiometric signal converter  
Potentiometric to DC isolating amplifier

#### Main features

- 3-way galvanic isolation
- Screw-fit terminals (removable)

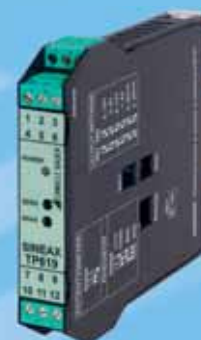
#### Technical data

Input: Resistor, rheostat, potentiometer  
Output: Current or voltage  
Test voltage: 500 V  
Accuracy: 0.2%  
Power supply: 19...40 V DC, 19...28 V AC  
Height x width x depth: 100 x 17.5 x 112 mm

#### Stock variants

Article No.	Description
162 876	SINEAX TP619

### SINEAX TP619



## SINEAX TVD820



### DC duplicator/isolating amplifier

Isolating amplifier  
DC-signal duplicator (current/voltage)

#### Main features

- 3-way galvanic isolation
- Screw-fit terminals removable

#### Technical data

Input: Current or voltage  
Output: Current or voltage selectable  
Testvoltage: 1.5 kV  
Accuracy: 0.2%  
Power supply: 19...40 V DC, 19...28 V AC  
Height x width x depth: 100 x 17.5 x 112 mm

#### Stock variants

Article No.	Description
162 909	SINEAX TVD820

## SINEAX TV829



### High-voltage isolation amplifier

for shunt and voltage measurement on high potential

#### Customer benefit

- Safe galvanic isolation according to DIN EN 61010-1 and DIN EN 50124 (Cat. III)
- High test voltage: 10 kV
- Calibrated range shaft
- High common-mode rejection ratio: 150 dB

#### Technical data

Input (switch-selectable):  $\pm 60$  mV,  $\pm 90$  mV,  $\pm 150$  mV,  $\pm 300$  mV,  $\pm 500$  mV,  $\pm 10$  V<sup>1</sup>  
 $\pm 400$  V,  $\pm 600$  V,  $\pm 800$  V,  $\pm 1000$  V,  $\pm 1200$  V  
 $\pm 1400$  V,  $\pm 1600$  V,  $\pm 1800$  V,  $\pm 2000$  V,  $\pm 2200$  V,  $\pm 3600$  V<sup>2</sup>  
Output (switch-selectable): 4...20 mA,  $\pm 20$  mA,  $\pm 10$  V  
Power supply: 24–253 AC/DC  
Height x width x depth: 90 x 22.5 x 118 mm (Article No. 158 312)  
90 x 67.5 x 118 mm (Article No. 158 320 and 158 338)

#### Stock variants

Article No.	Description
158 312	Shunt measurement: $\pm 60$ mV, $\pm 90$ mV, $\pm 150$ mV, $\pm 300$ mV, $\pm 500$ mV, $\pm 10$ V <sup>1</sup>
158 320	Voltage measurement: $\pm 400$ V, $\pm 600$ V, $\pm 800$ V, $\pm 1000$ V, $\pm 1200$ V
158 338	Voltage measurement: $\pm 1400$ V, $\pm 1600$ V, $\pm 1800$ V, $\pm 2000$ V, $\pm 2200$ V, $\pm 3600$ V <sup>2</sup>

<sup>1</sup> Only output  $\pm 10$  V

<sup>2</sup> Upon request (not switch-selectable)

# Camille Bauer

## Active signal converters

### Alarm unit

for unipolar and bipolar DC currents and voltages



#### Customer benefit

- 2 limit value relays with changeover contact
- Effective direction of relays/LED selectable using jumpers
- Limit value setting via potentiometer and test sockets
- Isolates signals for hazardous areas

#### Technical data

Input:  $-0.1 \dots +0.1$  mA to  $-50 \dots +50$  mA,  
 $-0.06 \dots +0.06$  V to  $-40 \dots +40$  V (Ex: max.  $\pm 30$  V)

Output:  $0 \dots 20$  mA,  $4 \dots 20$  mA,  $\pm 20$  mA or customised

Relay outputs: AC: 250 V, 2 A, 500 VA  
 DC: 250 V, 1 A, max. 30 W

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 120 x 17.5 x 146.5 mm

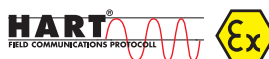
For the design of the SIRAX plug-in system (SIRAX C402) see page 43



SINEAX C402

### Power supply unit with additional functions

to energise 2-wire transmitters



#### Customer benefit

- HART pass-through
- Current or voltage output for standard signals and non-standard signals
- Suitable for the supply of transmitters in hazardous areas
- Line breakage and short-circuit monitoring via output signal or LED as well as relay

#### Technical data

Input circuit:  $4 \dots 20$  mA, supply voltage (20 mA): 24 V (non-Ex design),  
 16 V (Ex design)

Output:  $0 \dots 5$  V,  $1 \dots 5$  V,  $0 \dots 10$  V,  $1 \dots 10$  V or non-standard signals  
 $0 \dots 20$  mA,  $4 \dots 20$  mA or non-standard signals

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 120 x 17.5 x 146.5 mm (SINEAX)  
 Plug-in card in European format, face plate width 4TE (EURAX)

#### Stock variant (only SINEAX)

Article No.	Description
107 400	Power supply: 85–110 V DC/230 V AC, Ex design [EEx ia] IIC, without HART, without relay

19" assembly rack for EURAX plug-in cards see page 69  
 For the design of the SIRAX plug-in system (SIRAX B811) see page 41



SINEAX B811

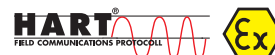
EURAX B811

## SINEAX B812



### Standard power supply unit

to energise 2-wire transmitters



#### Customer benefit

- HART pass-through
- Suitable for the supply of transmitters in hazardous areas
- Line monitoring via LED
- Setting time <0.3 ms

#### Technical Data

Input circuit:	4...20 mA, supply voltage (20 mA): 18 V
Output:	4...20 mA
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

#### Stock variants

Article No.	Description
155 102	Power supply: 85–110 V DC/230 V AC, Ex design [EEx ia] IIC, term. not pluggable
155 144	Power supply: 85–110 V DC/230 V AC, Ex design [EEx ia] IIC, terminals pluggable
155 095	Power supply: 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals not pluggable
155 136	Power supply: 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals pluggable
155 087	Power supply: 85–230 V AC/DC, non-Ex design, terminals not pluggable
155 128	Power supply: 85–230 V AC/DC, non-Ex design, terminals pluggable
155 079	Power supply: 24–60 V AC/DC, non-Ex design, terminals not pluggable
155 110	Power supply: 24–60 V AC/DC, non-Ex design, terminals pluggable

## SINEAX B840



### 4-channel power supply unit

to energise 2-wire transmitters

#### Customer benefit

- Cost-effective power supply unit with 4 channels
- Line monitoring
- Galvanic isolation between input circuits and power supply

#### Technical Data

Input circuit:	Supply voltage 24 V, current limit $\leq 25$ mA
Power supply:	24 V AC, 115 V AC, 230 V AC 50/60 Hz
Height x width x depth:	69.1 x 70 x 112.5 mm

#### Stock variants

Article No.	Description
147 464	Power supply 24 V AC
147 472	Power supply 115 V AC
147 480	Power supply 230 V AC

# Camille Bauer

## Active signal converters

### Power supply

Power supply for the CB-Power-Bus

#### Main features

- Bridging power supply through the DIN rail bus connector (CB-Power-Bus)
- Redundant power supply
- Built-in over-voltage (surge) protection
- Supply of up to 75 modules
- Two individual power supply sources can be connected to one SINEAX VS70 module
- Small dimensions
- Spring cage clamp connection

#### Technical data

Height x width x depth: 93.1 x 6.2 x 102.5 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
162 818	SINEAX VS70

### SINEAX VS70





## SIRAX V644



### Programmable universal transmitter

for thermocouples, resistance thermometers, current, voltage and resistance



#### Customer benefit

- All process variables as well as current and voltage output in one device
- 1 limit value relay offers monitoring function
- Suitable for temperature measurement in hazardous areas
- Sensor breakage monitoring

#### Technical data

Input:	Pt10...1000, Ni10...1000, Pt20/20, Cu10/25, Cu20/25 2, 3 or 4-wire connection Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re -1...+1 mV to -40...+40 V (Ex: max. $\pm 30$ V), -40...+40 $\mu$ A to -50...+100 mA 0...8 Ohm to 0...5 kOhm
Output:	-2.5...+2.5 mA to -22...+22 mA or -2...+2 V to -12...+15 V
Relay output:	AC: 250 V, 2 A, 500 VA; DC: 250 V, 1 A, max. 30 W
Power supply:	24-60 V AC/DC or 85-230 V AC/DC
Height x width x depth:	204 x 20.5 x 166 mm (SIRAX + BP902, 1 slot) 123.5 x 18 x 150.7 mm (SIRAX)

#### Stock variants SIRAX V644 + BP902 (1 slot)

Article No.	Description
125 296	Power supply 24-60 V AC/DC, without cold junction compensation, non-Ex design
125 303	Power supply 85-230 V AC/DC, without cold junction compensation, non-Ex design
125 311	Power supply 24-60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
125 329	Power supply 85-110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

#### Stock variants SIRAX V644

Article No.	Description
998 809	Power supply 24-60 V AC/DC, without cold junction compensation, non-Ex design
107 913	Power supply 85-230 V AC/DC, without cold junction compensation, non-Ex design
107 921	Power supply 24-60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
107 939	Power supply 85-110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

For suitable brackets see page 44

# Camille Bauer

## Active signal converters

### 2-channel programmable temperature transmitter

for thermocouples and resistance thermometers



#### Customer benefit

- Programmable without any power supply connection
- Zero and span calibration via software
- Suitable for temperature measurement in hazardous areas
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 in 2, 3 or 4-wire connection,  
Thermocouple type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re

Output: Programmable between 0...20 mA or 20...0 mA or  
0...10 V or 10...0V

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Stock variants

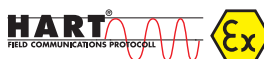
Article No.	Description
152 827	Power supply 24–60 V AC/DC, non-Ex design
152 835	Power supply 85–230 V AC/DC, non-Ex design
154 170	Power supply 24–60 V AC/DC, Ex design [EEx ia] IIC
154 188	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC

#### Accessories

Configuration software see page 64, PC connecting cable see page 67  
For suitable brackets see page 44

### 2-channel loop-powered supply unit

to energise 2-wire transmitters



#### Customer benefit

- No power supply connection required
- HART pass-through
- 1:1 transmission of the 4...20 mA signal
- Suitable for the supply of transmitters in Ex areas

#### Technical data

Input: 4...20 mA, voltage 12...30 V

Output: 4...20 mA  
Supply voltage = input voltage – voltage drop

Voltage drop: 2.7 V (without HART and Ex) up to 8.7 V (with HART and Ex)

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

### SIRAX V606



### SIRAX S1815



## SIRAX B811



### Power supply unit with additional functions

to energise 2-wire transmitters



#### Customer benefit

- HART pass-through
- Current or voltage output for standard signals and non-standard signals
- Suitable for the supply of transmitters in hazardous areas
- Line breakage and short-circuit monitoring via output signal or LED as well as relay

#### Technical data

Input circuit:	4...20 mA, supply voltage (20 mA): 24 V (non-Ex design), 16 V (Ex design)
Output:	0...5 V, 1...5 V, 0...10 V, 1...10 V or non-standard signals 0...20 mA, 4...20 mA or non-standard signals
Power supply:	24–60 V AC/DC or 85–230 V AC/DC
Height x width x depth:	123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

## SIRAX TI807



### One or multichannel passive signal isolator

for the galvanic isolation of 0...20 mA signals, test voltage 4 kV



#### Customer benefit

- Current or voltage output for standard signals
- High degree of accuracy
- Isolates signals for hazardous areas
- Up to 3 channels in one housing

#### Technical data

Input:	0...20 mA
Output:	0...20 mA, 0...10 V
Test voltage:	4 kV
Leakage voltage:	2.7 V (non Ex design), 4.7 V or 6.3 V (Ex design)
Height x width x depth:	123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

# Camille Bauer

## Active signal converters

### Configurable isolation amplifier

for unipolar and bipolar DC currents and voltages



#### Customer benefit

- 36 I/O combinations with jumpers configurable or customised measuring range
- Inputs and outputs for current and voltage in one device
- Intrinsically safe input for signals from hazardous areas
- Manual zero and span calibration

#### Technical data

Input: 0...20 mA, 4...20 mA,  $\pm 20$  mA,  
0...10 V, 2...10 V,  $\pm 10$  V or customised

Output: 0...20 mA, 4...20 mA,  $\pm 20$  mA,  
0...10 V, 2...10 V,  $\pm 10$  V or customised

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Accessories

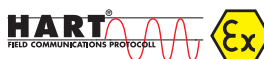
For suitable brackets see page 44

### SIRAX TV808-61



### Isolation amplifier with HART protocol

for DC currents and voltages and I/P valve positioners



#### Customer benefit

- Intrinsically safe output for I/P valve positioners in hazardous areas
- HART pass-through
- Unipolar and bipolar inputs, standard or customised signal

#### Technical data

Input:  $-1...+1$  mA to  $-20...+20$  mA,  
 $-0.06...+0.06$  V to  $-20...+20$  V

Output: 0...20 mA, 4...20 mA, 20...0 mA, 20...4 mA

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

### SIRAX TV808-615



### SIRAX TV808-62



### 2-channel isolation amplifier

for unipolar and bipolar DC currents and voltages

#### Customer benefit

- 2 isolated channels or 1 input/2 outputs
- Manual zero and span calibration
- 252 I/O combinations with solder bridges configurable or customised measuring range

#### Technical data

Input: Different ranges from 0.06 V to 20 V or 0.1 mA to 20 mA or customised

Output: 0...20 mA, 4...20 mA,  $\pm 20$  mA or customised

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

### SIRAX C402



### Alarm unit

for unipolar and bipolar DC currents and voltages



#### Customer benefit

- 2 limit value relays with changeover contact
- Effective direction of relays/LED selectable using jumpers
- Limit value setting via potentiometer and test sockets
- Isolates signals for hazardous areas

#### Technical data

Input:  $-0.1 \dots +0.1$  mA to  $-50 \dots +50$  mA,  
 $-0.06 \dots +0.06$  V to  $-40 \dots +40$  V (Ex: max.  $\pm 30$  V)

Output: 0...20 mA, 4...20 mA,  $\pm 20$  mA or customised

Relay output: AC: 250 V, 2 A, 500 VA

DC: 250 V, 1 A max. 30 W

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 123.5 x 18 x 150.7 mm

#### Accessories

For suitable brackets see page 44

# Camille Bauer

## Active signal converters

### Bracket for SIRAX modules

for SIRAX plug-in modules



#### Customer benefit

- Option of 1 slot or 8 slots
- Ex bracket with its own ATEX approval
- Slots can be coded
- Mechanical quick connection for simple fastening

#### Technical data

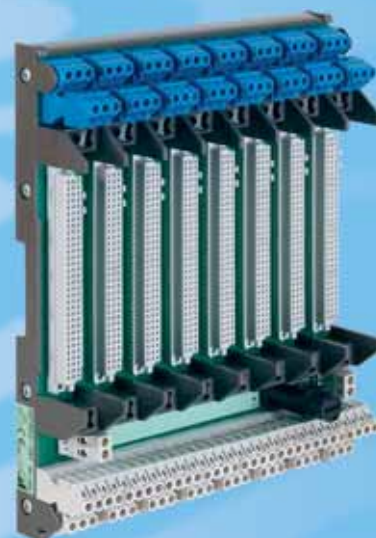
Power supply: 24–60 V AC/DC or 85–230 V AC/DC  
with 1.8 A T protection in 8 slots

Height x width x depth: 204 x 20.5 x 45 mm (1 slot)  
204 x 165 x 50 mm (8 slots)

#### Stock variants

Article No.	Description
120 038	1 slot, non-Ex design
120 054	8 slots, non-Ex design
120 046	1 slot, Ex design [EEx ia] IIC
120 062	8 slots, power supply 85–230 V AC/DC, Ex design [EEx ia] IIC

### SIRAX BP902



**Content multifunctional signal converters**

**Temperature transmitter**

SINEAX V624 Programmable temperature transmitter ..... 46

**Isolation amplifier**

SINEAX TV809 Programmable isolation amplifier ..... 47

**Multifunctional transmitters**

SINEAX/EURAX V604 Programmable universal transmitter ..... 48

SINEAX/EURAX VC603 Programmable combined transmitter / alarm unit ..... 49

SINEAX V604s Programmable multifunctional transmitter / alarm unit ..... 50

# Camille Bauer

## Multifunctional signal converters

### Programmable temperature transmitter

for thermocouples and resistance thermometers



#### Customer benefit

- Programmable without any power supply connection
- Zero and span calibration via software
- Suitable for temperature measurement in hazardous areas
- Sensor breakage and short-circuit monitoring

#### Technical data

Input: Pt100, Ni100 in 2, 3 or 4-wire connection,  
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re

Output: Programmable between 0...20 mA or 20...0 mA  
or 0...10 V or 10...0 V

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

Height x width x depth: 69.2 x 17.5 x 114 mm (terminals not pluggable)  
85 x 17.5 x 114 mm (terminals pluggable)

#### Stock variants

Article No.	Description
141 896	Power supply 24–60 V AC/DC, non-Ex design, terminals not pluggable
141 903	Power supply 85–230 V AC/DC, non-Ex design, terminals not pluggable
143 412	Power supply 24–60 V AC/DC, non-Ex design, terminals pluggable
143 420	Power supply 85–230 V AC/DC, non-Ex design, terminals pluggable
141 911	Power supply 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals not pluggable
141 929	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC, terminals not pluggable
143 438	Power supply 24–60 V AC/DC, Ex design [EEx ia] IIC, terminals pluggable
143 446	Power supply 85–230 V AC/DC, Ex design [EEx ia] IIC, terminals pluggable

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

### SINEAX V624





SINEAX TV809



Programmable isolation amplifier

for unipolar and bipolar DC currents and voltages



Customer benefit

- Current or voltage output in one device
- Safe isolation, enhanced up to 600 V (Cat. II) or 1000 V (Cat. I)
- Limit value relay secures monitoring function
- Intrinsically safe input for signals from hazardous areas

Technical data

Current input:	-1.5...+1.5 mA to -100...+100 mA
Voltage input:	-1.7...+1.7 V to -1000...+1000 V
Current output:	-0.5...+0.5 mA to -20...+20 mA
Voltage output:	-0.5...+0.5 V to -10...+10 V
Relay output:	AC: 250 V, 2 A, 500 VA, DC: 125 V, 2 A, max. 60 W
Power supply:	24-60 V AC/DC or 85-230 V AC/DC
Height x width x depth:	69.2 x 17.5 x 114 mm (terminals not pluggable) 85 x 17.5 x 114 mm (terminals pluggable)

Stock variants

Article No.	Description
147 282	Power supply 85-230 V, terminals pluggable
147 258	Power supply 24-60 V, terminals not pluggable
147 266	Power supply 85-230 V, terminals not pluggable

Accessories

Configuration software see page 64, PC connecting cable see page 67

# Camille Bauer

## Multifunctional signal converters

### Programmable universal transmitter

for thermocouples, resistance thermometers, current, voltage and resistance



#### Customer benefit

- All process variables as well as current and voltage output in one device
- 1 limit value relay offers monitoring function
- Suitable for temperature measurement in hazardous areas
- Sensor breakage monitoring

#### Technical data

Input: Pt10...1000, Ni10...1000, Pt20/20, Cu10/25, Cu20/25 in 2, 3 or 4-wire connection  
 Thermocouple type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re  
 -1...+1 mV to -40...+40 V (Ex: max.  $\pm 30$  V),  
 -40...+40  $\mu$ A to -50...+100 mA  
 0...8 Ohm to 0...5 kOhm

Output: -2.5...+2.5 mA to -22...+22 mA or  
 -2...+2 V to -12...+15 V

Relay output: AC: 250 V, 2 A, 500 VA; DC: 250 V, 1 A, max. 30 W

Power supply: 24-60 V AC/DC or 85-230 V AC/DC

Height x width x depth: 120 x 17.5 x 146.5 mm (SINEAX)  
 Plug-in card in European format, face plate width 4TE (EURAX)

#### Stock variants SINEAX V604

Article No.	Description
973 059	Power supply 24-60 V AC/DC, internal cold junction compensation, non-Ex design
973 083	Power supply 85-230 V AC/DC, internal cold junction compensation, non-Ex design
973 116	Power supply 24-60 V AC/DC, internal cold junction comp., Ex design [EEx ia] IIC
973 140	Power supply 85-110 V DC / 230 V AC, internal cold junction compensation, Ex design [EEx ia] IIC

#### Stock variants EURAX V604

Article No.	Description
997 588	Power supply 24-60 V AC/DC, without cold junction compensation, non-Ex design
997 603	Power supply 85-230 V AC/DC, without cold junction compensation, non-Ex design
997 629	Power supply 24-60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
997 645	Power supply 85-110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

19" assembly rack for EURAX plug-in cards see page 69

For the design of the SIRAX plug-in system (SIRAX V644) see page 39

### SINEAX V604



### EURAX V604



## SINEAX VC603



## EURAX VC603



### Programmable combined transmitter/alarm unit

for thermocouples, resistance thermometers,  
current, voltage and resistance



#### Customer benefit

- All process variables as well as current and voltage output in one device
- 3 limit value relays offer numerous monitoring functions
- Suitable for temperature measurement in hazardous areas
- Sensor breakage monitoring

#### Technical data

Input: Pt10...1000, Ni10...1000, Pt20/20, Cu10/25, Cu20/25 in 2, 3 or 4-wire connection  
Thermocouples type B, E, J, K, L, N, R, S, T, U, W5Re/W26Re  
-1...+1 mV to -40...+40 V (Ex: max.  $\pm 30$  V),  
-40...+40  $\mu$ A to -50...+100 mA  
0...8 Ohm to 0...5 kOhm

Output: -2.5...+2.5 mA to -22...+22 mA or  
-2...+2 V to -12...+15 V

Relay outputs: AC: 250 V, 2 A, 500 VA; DC: 250 V, 1 A, max. 30 W

Power supply: 24-60 V AC/DC or 85-230 V AC/DC

Height x width x depth: 120 x 17.5 x 146,5 mm (SINEAX)  
Plug-in card in European format, face plate width 4TE (EURAX)

#### Stock variants SINEAX VC603

Article No.	Description
987 670	Power supply 24-60 V AC/DC, internal cold junction compensation, non-Ex design
987 852	Power supply 85-230 V AC/DC, internal cold junction compensation, non-Ex design
987 894	Power supply 24-60 V AC/DC, internal cold junction comp., Ex design [EEx ia] IIC
987 935	Power supply 85-110 V DC / 230 V AC, internal cold junction compensation Ex design [EEx ia] IIC

#### Stock variants EURAX VC603

Article No.	Description
997 455	Power supply 24-60 V AC/DC, without cold junction compensation, non-Ex design
997 471	Power supply 85-230 V AC/DC, without cold junction compensation, non-Ex design
987 497	Power supply 24-60 V AC/DC, without cold junction comp., Ex design [EEx ia] IIC
987 512	Power supply 85-110 V DC / 230 V AC, without cold junction compensation, Ex design [EEx ia] IIC

#### Accessories

Configuration software see page 64, PC connecting cable see page 67

19" assembly rack for EURAX plug-in cards see page 69

# Camille Bauer

## Multifunctional signal converters

### Programmable multifunctional transmitter / alarm unit

for currents, voltages, temperature sensors, remote transducers or potentiometers

#### Main features

- Measurement of DC voltage, DC current, temperature (RTD or TC), resistance
- Sensor connection without external jumpers
- 2 inputs (e.g. for sensor redundancy or differential measurement)
- 2 outputs (U and/or I)
- 2 inputs can be combine with each other and can be related to the 2 outputs. With the calculations to example a sensor monitoring is possible (e.g. for a predictive maintenance of the sensors)
- System capability: communication through Modbus-interface
- Programmable relays, e.g. for limit values and alarms
- AC/DC wide range power supply unit
- Pluggable top quality value screw terminals

#### Technical data

Input 1 and 2: Pt100, adjustable Pt20...Pt1000,  
Ni100, adjustable Ni50...Ni1000  
2, 3 or 4 wire connection  
Thermocouple types B, E, J, K, L, N, R, S, T, U, W5Re/W26Re, W3Re/W25Re  
-1000...+1000 mV, unipolar/bipolar,  
-300...+300 V, unipolar/bipolar  
-50...+50 mA, unipolar/bipolar  
0...5 kOhm, 2 or 3 wire connection

Output 1 and 2:  $\pm 20$  mA, uni/bipolar, range adjustable or  
 $\pm 10$  V, uni/bipolar, range adjustable

Relay output: AC: 250 V, 2 A, 500 VA; DC: 30 V, 2 A (resistiv...cos  $\varphi$ )

Power supply: 24-230 V DC, 100-230 V AC,  $\pm 15\%$

Height x width x depth: 118 x 22.5 x 108 mm (incl. top-hat rail)

#### Stock variants

Article No.	Description
168 329	Standard device with power supply 24-230 V DC, 100-230 V AC

#### Accessories

Configuration software see page 65, PC connecting cable see page 67

A converter from RS485 to USB is required for PC connection.  
E.g. Art. No. 163 189 USB to RS485 converter, see page 67

### SINEAX V604s



## Content Process management

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### Overview videographic recorders

					
Features	LINAX A303	LINAX A305	LINAX A310	LINAX A325	LINAX A330
Display	120 mm (4,7 Zoll) LCD	144 mm (5,7 Zoll) TFT; 120 mm (4,7 Zoll) monochrom	125 mm (5 Zoll) LCD	178 mm (7 Zoll) TFT	310 mm (12,1 Zoll) TFT
Front panel and depth	144 x 144 x 171 mm	144 x 144 x 50 mm	144 x 144 x 195 mm	190 x 144 x 158 mm	288 x 288 x 195 mm
Universal analog inputs	3 resp. 6	1, 2, 3 resp. 4 (8 via Modbus)	6 resp. 12	4, 8, 12, 16 resp. 20 (40 via Modbus or Profibus)*	6, 12, 18, 24, 30 resp. 36
Memory internal/external	2 MB / CF card	8 MB / SD card	1 MB / CF card	256 MB / SD card or USB stick	8 MB / CF card
Transmitter power supply	24 V / 250 mA	2 x 24 V / 22 mA	6 x 24 V / 45 mA	24 V / 200 mA	5 x 24 V / 45 mA
Digital inputs	3	via analog inputs	6, 12 resp. 18	6 resp. 14	6, 12, 18 resp. 24
Limit values / Relays	14 / 4	32 / 3	24 / 6, 12 bzw. 18	100 / 6 bzw. 12	144/6, 12, 18 bzw. 24
Interfaces	USB, RS232 / RS485, Ethernet TCP/IP, Webserver	Ethernet: TCP/IP, HTTP, FTP (Server), Modbus TCP (Slave/Master), Webserver, E-Mail	Ethernet: TCP/IP, HTTP, FTP (Server), Modbus TCP (Slave/Master), Webserver, E-Mail, RS485: Modbus RTU (Slave/Master)	USB, RS232 / RS485, Modbus RTU/TCP, Profibus DP, Ethernet, Webserver, E-Mail	Ethernet: TCP/IP, HTTP, FTP (Server), Modbus TCP (Slave/Master), Webserver, E-Mail, RS 485: Modbus RTU (Slave/Master)
Additional functions	Mathematic	Mathematic	Batch	Mathematic / waste water / telealarm / batch	Mathematic / batch
Process groups	1	2	2	10	6
Supply voltage	90 VAC to 250 VAC 24 VDC	85 VAC to 265 VAC 10 VDC to 36 VDC	85 VAC to 265 VAC 20 VDC to 28 VDC	90 VAC to 250 VAC 20 VDC to 30 VDC	90 VAC to 265 VAC
FDA 21 CFR PART 11	no	standard	standard	standard	standard
Protection	IP54 / NEMA2 (front)	IP66 / NEMA4X	IP66 / NEMA4X (front)	IP65 / NEMA4 (front)	IP66 / NEMA4X (front)

\* The LINAX A325 is able to display 16 digital and 8 mathematic channels additional to the respectively 40 inputs

## LINAX A303



### Videographic recorder with basic functions

for control cabinet installation

#### Main features

- Inexpensive videographic recorder for basic applications
- Very distinct, high-quality LCD display
- Device can be equipped and extended according to customer requirements
- Device protection IP54 / NEMA2 (front)
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	3 resp. 6
Display:	12 cm (4.7 inch) LCD colour
Operation:	6 buttons and help button
Memory:	2 MB intern / CF Card extern
Communication:	USB, RS232 / 485, Ethernet TCP/IP, integrated web-server
Transmitter power supply:	24 V / 250 mA
Process alarms:	14
Additional functions:	Mathematic functions
Height x width x depth:	144 x 144 x 171 mm

## LINAX A305



### Videographic recorder in field housing

for control cabinet, wall or pipe installation

#### Customer benefit

- Ultracompact recorder – installation depth only 50 mm
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	8 (up to 4 universal inputs)
Display:	14.4 cm (5.7 inch) TFT colour or 12 cm (4.7 inch) monochrome
Operation:	6 buttons
Memory:	8 MB internally, up to 1 GB externally (SD card)
Communication:	TCP/IP, HTTP, SMTP, FTP (server), Modbus TCP (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 2 loops
Process alarms:	32
Additional functions:	16 totalisers, mathematic and logic functions
Height x width x depth:	144 x 144 x 50 mm

# Camille Bauer

## Process management

### Videographic recorder with extended functions

for control cabinet, wall or pipe installation

#### Customer benefit

- Ultracompact recorder – installation depth only 50 mm
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	8 (up to 4 universal inputs)
Display:	14.4 cm (5.7 inch) TFT colour or 12 cm (4.7 inch) monochrome
Operation:	6 buttons
Memory:	8 MB internally, up to 1 GB externally
Communication:	TCP/IP, HTTP, SMTP, FTP (server), Modbus TCP (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 2 loops
Process alarms:	32
Additional functions:	16 totalisers, mathematic and logic functions
Height x width x depth:	144 x 144 x 50 mm

### LINAX A310



### Videographic recorder with touch screen

for control cabinet installation

#### Customer benefit

- High-quality, cost-effective videographic recorder
- Simple intuitive operation based on Windows
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	Up to 12 universal inputs
Display:	12.5 cm (5 inch) LCD
Operation:	6 buttons
Memory:	1 MB internally, up to 1 GB externally
Communication:	TCP/IP, HTTP, FTP (server), Modbus RTU (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 12 loops
Process alarms:	24
Additional functions:	12 totalisers
Height x width x depth:	144 x 144 x 195 mm

### LINAX A320





## LINAX A325



### High-performance videographic recorder

for control cabinet installation

#### Customer benefit

- Powerful videographic recorder with high performance
- Simple intuitive operation, with built-in Help
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP65 / NEMA4 device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	4, 8, 12, 16 bzw. 20 universal inputs (40 via Modbus oder Profibus)
Display:	17.8 cm (7 inch) TFT
Operation:	4 function buttons and Joy-/Shuttle or via USB keyboard
Memory:	256 MB intern, up to 1 GB externally (SD Card or USB stick)
Communication:	TCP/IP, HTTP, FTP (Server), Modbus RTU (Slave) integrated web-server, E-mail function
Transmitter power supply:	24 V / 200 mA
Process alarms:	100
Additional functions:	Mathematic function, additional functions for wastewater, telealarm and charge
Height x width x depth:	190 x 144 x 158 mm

## LINAX A330



### Videographic recorder with large screen

for control cabinet installation

#### Customer benefit

- Videographic recorder of high performance and quality with a large screen
- Simple intuitive operation based on Windows
- Device can be equipped and extended according to customer requirements
- For applications in rough environment due to IP66 / NEMA4X device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

#### Technical data

Number of channels:	Up to 36 universal inputs
Display:	31 cm (12.1 inch) TFT
Operation:	8 buttons
Memory:	8 MB internally, up to 1 GB externally (CF card)
Communication:	TCP/IP, HTTP, FTP (server), Modbus RTU (master/slave) integrated web-server, E-mail function
Transmitter power supply:	Up to 12 loops
Process alarms:	144
Additional functions:	144 totalisers, mathematic and logic functions
Height x width x depth:	288 x 288 x 195 mm

# Gossen Metrawatt

## Process management

### Panel-mount paper recorder

1 to 4-channel line recorder, LINAX 4000L / M / H

#### Functions

- Safe measurement due to galvanic isolation of the measuring channels
- Combined plotter for paper rolls or continuous fan-fold paper
- Automatic paper feed
- The modular design permits retrofitting of complete measuring systems
- LINAX 4000M
  - Free programming of the measuring task
  - Graphic representation of the measured values via printing channel
  - RS 485 interface
- LINAX 4000H
  - Representation of measured values and texts in the digital display
  - RS 485 interface
  - Measured value storage also in standby operation
  - Option to record mean values, sums or minimum and maximum values in the interval
  - 64 m paper roll

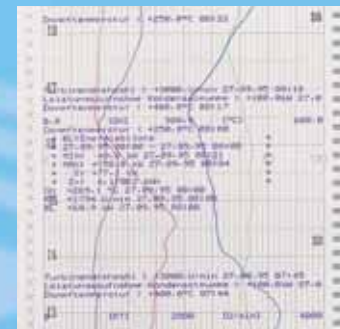
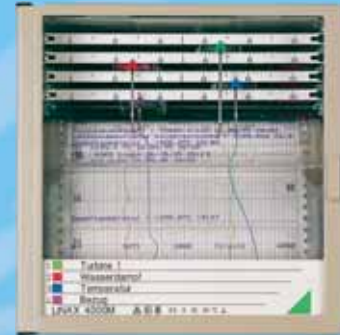
#### Technical data

Measuring inputs: Thermocouple, Pt100, DC, DC voltage  
depending on recorder design

Power supply: 24–85 V AC/DC, 95–240 V AC/DC

Height x width x depth: 144 x 144 x 250 mm (L/M), 144 x 144 x 300 mm (H)

### LINAX 4000



### Panel-mount paper recorder

6-colour dot printer, POINTAX 6000L2 / M

#### Functions

- 6 measuring channels
- Last printed point visible from the front
- Measuring channels galvanically isolated and earth-free
- Combined plotter for paper rolls (32 m) or continuous fan-fold paper (16 m)
- RS 485 interface
- Parameterising software PARATOOL
- 6000M
  - Text printout
  - 2 limit values per channel
  - Balancing
  - 4 event marks
  - Alternative applications as an event recorder with 10 event marks

#### Technical data

Measuring input: Thermocouple, Pt100, DC, DC voltage  
according to recorder design











Power supply: 24–85 V AC/DC, 95–240 V AC/DC

Height x width x depth: 144 x 144 x 250 mm

### POINTAX 6000



Overview controllers and control systems

												
Series	Compact controllers				Control systems							
Designation (type)	R2500	R2700	R2601	R2900	R6000	R355 4-chan.	R355 8-chan.	VR660 / A200R		Soft- controller	OEM	
Replacement for GTR ....												
Dimensions (mm)	Height	48	96	48	96	160	125	125	85	96	—	<input type="checkbox"/>
	Width	48	48	96	96	110	40	80	23	96	—	<input type="checkbox"/>
	Depth	118	109	109	50/70	50	120	120	114	46	—	<input type="checkbox"/>
Control panel mounting	●	●	●	●	●	●	●	—	●	—	●	
Top-hat rail				■	●	●	●	●	—	—	●	
Channels	1	1	1	1	4/8	4	8	1-32		>1	<input type="checkbox"/>	
2-step controller	●	●	○	○	●	●	●	●		●	●	
3-step controller	●	●	○	○	●	●	●	●		●	●	
Continuous-action controller	○	○	○	○	○	●	●	—		●	●	
Step-action controller	●	●	○	○	●	●	●	—		●	●	
Hot runner controller	●	●	—	—	●	●	●	—		●	●	
Differential/slave controller	—	●	○	○	●	●	●	—		●	●	
Cascade controller	—	●	—	—	●	●	●	—		●	●	
Program controller	●	●	—	—	—	—	—	—		—	●	
Input												
Thermocouple	○	○	○	○	○	○	○	●		●	●	
Pt 100	○	○	○	○	○	○	○	●		●	●	
Linear	○	○	○	○	○	○	○	●		●	●	
Output												
Relay	●	●	●	○	—	—	—	—		●	●	
Transistor	●	●	●	○	●	●	●	●		●	●	
Alarms	●	●	2	2	●	●	●	●		●	●	
Self-tuning	●	●	●	●	●	●	●	●		●	●	
Proxy setpoint	●	●	●	●	●	●	●	●		●	●	
Heating current monitoring	○	●	●	●	●	●	●	●		●	●	
Software												
Software Config Tools	●	●	—	—	●	●	●	—	—	—	<input type="checkbox"/>	
Software Remote Tools	—	○	—	—	○	○	○	—	—	—	<input type="checkbox"/>	
CB-Manager	—	—	—	—	—	—	—	●	●	—	—	
Auxiliary power												
Auxiliary power VAC	85 to 265		24, 115, 230	110 to 230	—	—	—	24 to 230		—	<input type="checkbox"/>	
Auxiliary power VDC	24		24	—	24	24	24	24 to 230		—	<input type="checkbox"/>	
Special features												
Heating circuit monitoring	●	●	●	●	●	●	●	●		●	●	
Ramp function	●	●	●	●	●	●	●	●		●	●	
Data logger	●	●	—	—	●	●	●	via Software		—	●	
Alarm history	●	●	—	—	●	●	●	—		—	●	
Mapping	—	—	—	—	●	●	●	—		—	●	
Booster circuit	●	●	—	—	●	●	●	—		●	●	
Infrared front interface	●	●	—	—	—	—	—	—		—	—	
RS232	—	—	○	○	●	●	●	—	●	—	<input type="checkbox"/>	
RS485	○	○	○	○	○	via CPU		●	—	—	<input type="checkbox"/>	
Profibus DP	—	○	—	—	○	via CPU		—	—	—	<input type="checkbox"/>	
CAN/CANopen	—	—	—	—	○	via CPU		—	—	—	<input type="checkbox"/>	
MODBUS	○	○	—	—	○	via CPU		●	—	—	<input type="checkbox"/>	
ETHERNET / TCP IP	—	—	—	—	○	via CPU		—	—	—	<input type="checkbox"/>	
MPI	—	—	—	—	via CPU	via CPU		—	—	—	<input type="checkbox"/>	
PROFINET	—	—	—	—	via CPU	via CPU		—	—	—	<input type="checkbox"/>	

● = Default      ○ = Order option      ■ = Variant A1...A6, D0, F0      □ = in accordance with customer specification

# Gossen Metrawatt Process management

## Compact controller, limiter and programmer

for control cabinet installation

### Customer benefit

- Cost-effective controller and limiter with extensive functionalities
- Structured operating and programming procedure
- CompactConfig software tool free of charge
- Applications in rough environment due to IP67
- Standard infrared front interface for fast and convenient commissioning and readout of the data logger or the alarm history
- Suitable for precise control tasks without overshooting
- Sampling cycle 100 ms with integrated transformation to suppress 50/60 Hz
- Hot-runner control and water cooling

### Technical data

Height x width x depth: 48 x 48 x 119 mm (R2500), 96 x 48 x 129 mm (R2700)

Measuring inputs: Thermocouple, Pt100, Ni100, DC or DC voltage

Outputs: Relay, transistor, continuous, alarm

Power supply: 20–30 V DC, 85–265 V AC

### Stock variants

Article No.	Description
R2500-V001	Power supply: 85-230 V AC, measuring input temperature, 2 transistor outputs
R2500-V002	Power supply: 85-230 V AC, measuring input temperature, 1 output each for relay, transistor, continuous
R2700-V001	Power supply: 85-230 V AC, measuring input temperature, 2 transistor outputs
R2700-V002	Power supply: 85-230 V AC, measuring input temperature, 2 relay and transistor outputs
R2700-V003	Power supply: 85-230 V AC, measuring input temperature, 1 continuous and 2 transistor outputs
R2700-V004	Power supply: 85-230 V AC, measuring input temperature, 1 continuous, 2 relay and transistor outputs

### Accessories

Softwaretool CompactConfig see page 66

Remote maintenance, remote diagnostics and commissioning tool CompactRemote see page 66

R2500



R2700



R2601



## CompactConfig



## CompactRemote



## R2900



## Compact controller

for switchboard installation

### Customer's benefit

- Excellent controller with extensive functionalities
- Structured using and programming scheme
- Suitability for precise and without overshooting controller functions
- Digital displays for actual value, as well as setpoint / manipulating factor / heating current
- Version as two-step, three-step, step-action, continuous action, differential and follow-up controller
- Many monitoring functions

### Technical data

Measuring inputs: Thermocouple, Pt 100 (2/3-wire) or standard signal 0/2 ... 10 V and 0/4 ... 20 mA  
 Outputs: Relay, transistor, standard signal, limit contacts  
 Power supply: 95...253 V AC; 48...62 Hz  
 Height x width x depth: 96 x 96 x 50 mm

## R6000



## 8-channel control module

for top-hat rail installation

### Customer benefit

- Control channels freely configurable as well as any allocation of the outputs
- Structured operating and programming procedure
- R6Konfig software tool free of charge
- Universal bus connections; Profibus-DP, CAN-Bus, Modbus (RS-485)
- Suitable for precise control tasks without overshooting
- Sampling cycle 10 ms per channel, 100 ms per device with integrated transformation to suppress 50/60 Hz
- Hot-runner control and water cooling
- Data logger and alarm history to prepare an error analysis
- Power limitation; limitation of power consumption, energy optimising

### Technical data

Measuring inputs: Thermocouple, Pt100, Ni100, 0/4...20 mA  
 Output: Binary I/Os, continuous  
 Power supply: 24 V DC (18–30 V DC)  
 Height x width x depth: 182 x 109 x 78 mm

### Stock variants

Article No.	Description
R6000-V001	Power supply: 24 V DC, measuring input temperature, 16 binary I/Os, Profibus-DP
R6000-V002	Power supply: 24 V DC, measuring input temp., 16 binary I/Os, Modbus RS 485
R6000-V003	Power supply: 24 V DC, measuring input temperature, 16 binary I/Os, CAN-Bus

## R6Konfig



### Accessories

Software tool R6Konfig see page 66

# Gossen Metrawatt

## Process management

### 4-/8-channel control module for SIMATIC platform

System compatible for S7-300

#### Customer benefit

- Central bus connection via back plane, decentralised connection via Profibus slave
- Control channels freely configurable as well as any allocation of the outputs
- Structured operating and programming procedure
- 355Config software tool free of charge
- 355Remote; remote maintenance tool via CPU independent of interfaces
- Suitable for precise control tasks without overshooting
- Sampling cycle 10 ms per channel, 100 ms per device with integrated transformation to suppress 50/60 Hz
- Hot-runner control and water cooling
- Data logger and alarm history to prepare an error analysis
- Power limitation; limitation of power consumption, energy optimising

#### Technical data

Measuring inputs: Thermocouple, Pt100, Ni100, DC current or voltage  
 Outputs: Binary I/Os, continuous  
 Power supply: 24 V DC (18–30 V DC)  
 Height x width x depth: 125 x 40 x 120 mm (4 channels)  
 125 x 80 x 120 mm (8 channels)

#### Stock variants

Article No.	Description
R355A	4 channels, measuring input current/voltage, without binary I/Os
R355B	4 channels, measuring input thermocouple/Pt100, without binary I/Os
R355C	8 channels, measuring input current/voltage, without binary I/Os
R355D	8 channels, measuring input thermocouple/Pt100, without binary I/Os
R355E	4 channels, measuring input current/voltage, 8 binary I/Os
R355F	4 channels, measuring input thermocouple/Pt100, 8 binary I/Os
R355G	8 channels, measuring input current/voltage, 24 binary I/Os
R355H	8 channels, measuring input thermocouple/Pt100, 24 binary I/Os

#### Accessories

Softwaretool 355Config see page 66

Remote maintenance, remote diagnostics and commissioning tool 355Remote see page 66

R355



355Config



355Remote



## PDPI SOFTcontroller



## PDPI SOFTcontroller

in CoDeSys and PC Worx (Phoenix Contact) programming languages

### Customer benefit

- Simple integration into all control systems
- Suitable for precise control tasks without overshooting
- Sampling cycle 1 ms depending on control
- Any extension of the control channels within CPU, IPC or panel
- Large range of functions with options for extensions as required
- Price advantage through licence acquisition

### Technical data

Basic function component in CoDeSys

Professional function component in CoDeSys

Basic function component in PC Worx

Professional function component in PC Worx

## OEM control systems

for Customer Applications

### Operation and Display

- As desired, ideally matched to the application

### Interconnection to the Controller

- Matched to existing hardware, software and communications equipment (Siemens, B&R, Beckhoff etc.)

### Control Performance

- Controllable according to individual needs, matched to the application
- Dynamics, adaptation, links ... upon request
- Special and/or patented company know-how can be integrated
- Expandable functionality (even after installation!)

### Process Variable Inputs

- Optimized number matched to the application, mechanical limitations ...
- Adaptation of non-standardized sensor types as well
- Integrated process variable monitoring
- Process variable can be manipulated via interface or bus

### Controlled Variable Outputs

- Optimized number matched to the application, mechanical limitations ...
- Special, non-standardized outputs as well
- Controlled variable can be manipulated via interface or bus
- Actuators and actuator monitoring can be integrated



### Modular temperature control system

for individual optimum solutions

#### Customer benefit

- Autarkic, simply extendable control components
- Ergonomic / event-oriented onsite visualising
- Onsite operation
- Comprehensive operating concept (from 1-channel to multichannel control system)
- Precise PDPI control algorithm without overshooting
- Complete pertaining sensorics program
- Cost-effective overall system

#### Technical data

Measuring inputs:	Thermocouples, Pt100 (also Pt50...1000), Ni100 (also Ni50...1000), voltage (-1...1V)
Outputs:	4 digital outputs (for SSR relays or PLC inputs) Heating – Cooling – Alarm 1 – Alarm 2
Power supply:	24–230 V DC/AC, 45–400 Hz
Controller behaviour:	2-point PDPI controller (heating or cooling) 3-point PDPI controller (heating or cooling)
Accuracy:	$\geq \pm 0.5$ K
Interface:	RS 485
Height x width x depth:	85 x 23 x 114 mm (top-hat rail controller) 96 x 96 x 46 mm (operating and display unit)

### SINEAX VR660 / A200R





**Content software and accessories**

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# Camille Bauer Software and accessories

## Configuration software

to parameterise programmable CB devices

The CD contains the following PC software:

### VC600, V600plus

- Accessing the configuration stored in the transmitter and printing it as a protocol
- Fetching and visualising the allocation of electrical terminals (for measured variable, output signal, contact output and power supply)
- Simulating measured value, underflow, overflow and sensor breakage and checking the corresponding behaviour of the output signal
- Adjusting zero point and span
- Representing the current measured value on the screen

### V600plus, additional features

- Visualising, storing and printing of measured values
- Activating password protection

### TV800plus

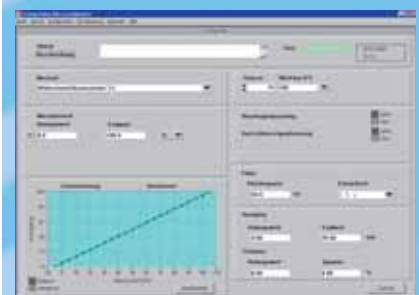
- Measuring input (current, voltage, measuring range), measuring output (current, voltage, output area) and relay functions are PC-programmable
- Input filter programmable
- Scalable transmission behaviour, also with signal reversal
- Option of linearising the input signal
- Online access of measured values and output activation possible via PC
- Limit value setting of the relay (option)

The CD contains further PC software for angular position and heavy current instrumentation.

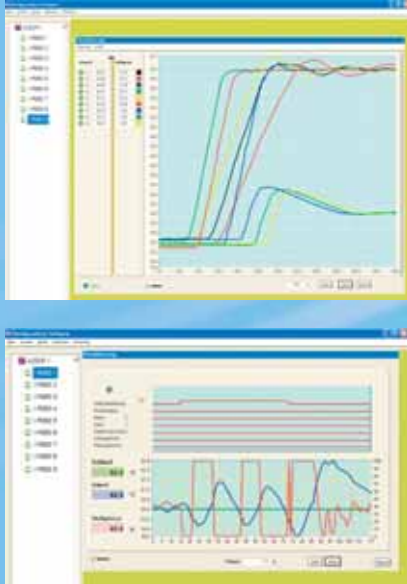
### Content of the CD

Software	For devices	Language	Operating system
V600plus	SINEAX VK616, VK626, V608, V624, V611, SIRAX V606	D, E, F, N, I, S	9x, NT4.x, 2000, ME, XP
VC600	SINEAX/EURAX V604, VC603, SIRAX V644	D, E, F, N	9x, NT4.x, 2000, ME, XP
TV800plus	SINEAX TV809	D, E, F, N	9x, NT4.x, 2000, ME, XP
DME 4	SINEAX/EURAX DME4xx	D, E, F, N, I	9x, NT4.x, 2000, ME, XP
M560	SINEAX M561, M562, M563	D, N, F, N, S	9x, NT4.x, 2000, ME, XP
2W2	KINAX 2W2, WT711, WT717 and SR719	D, E, F, N	9x, NT4.x, 2000, ME, XP
A200plus	SINEAX A210, A220, A230, A230s with EMMOD 201 or EMMOD 203	D, E, F, N	9x, NT4.x, 2000, ME, XP
A200plus handheld	A210-HH, A230-HH	D, E, F, N	9x, NT4.x, 2000, ME, XP

Article No.	Description
146 557	Configuration software (CD)



## Configuration software CB-Manager



for the modular SINEAX VR660 / A200R control system and for the programmable multifunctional transmitter / alarm unit V604s

The software permits

- Storing of configuration files in devices
- Reading of device configuration
- Archiving of configuration files for individual devices or the entire bus system
- Visualising of measured values
- User-friendly commissioning
- Pre-engineering of a system without the connection of devices
- Service functions

The software may also be used for the follow devices:

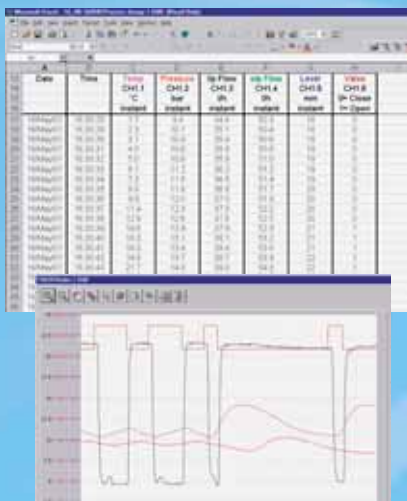
- SINEAX VR660 / A200R
- SINEAX V604s
- SINEAX CAM
- APLUS

Article No.	Description
-------------	-------------

156 027	Configuration software CB-Manager (CD)
---------	----------------------------------------

This CD is part of the scope of delivery of SINEAX VR660, SINEAX V604s, SINEAX CAM and APLUS.

## Data Manager software / Data-Analyzer software



Review software for the videographic recorders of the A300 family

- Archiving, visualising and analysing of process data:  
Data is easily imported into the Data Manager from the LINAX recorder
- Data security from the process to the PC: Consistent continuation of the data security concept of the LINAX series complying with FDA 21 CFR Part 11
- Automatic validation of archived data on basis of coded digital signatures:  
Clear display of the integrity of data files
- Graphic representation of process data:  
Horizontal trend display including analysis aids
- Automatic import of archived data:  
Automatic tabulation of data and event protocols

Article No.	Description
-------------	-------------

155 748	Software and documentation CD for LINAX
---------	-----------------------------------------

# Gossen Metrawatt Software and accessories

## Specification tools

### CompactConfig

(German, English, French, Italian)  
for R2500 and R2700

- Software for online and offline device and parameters configuration
- Automatic generation of a wiring diagram
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets
- Graphic setup of the program controller

Remote tool for initial start-up, service and remote maintenance

### CompactRemote

(German, English)  
for R2700 with Profibus-DP

CompactConfig can access the controller via Ethernet TCP/IP, Profibus-DP or MPI.

- Software for online and offline device and parameters configuration
- Automatic generation of a wiring diagram
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets

### R6Konfig

(German, English, French, Italian)  
for R6000

- Software for online and offline device and parameters configuration
- Storage and expression of the parameter and configuration values
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets
- Importing and exporting a prepared parameter sets in the format of a S7 data blocks (WLD file) in the SIMATIC manager

### 355Config

(German, English, French, Italian)  
via RS232 Interface direct on the controller R355

- Software for online and offline device and parameters configuration
- Storage and expression of the parameter and configuration values
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets
- Importing and exporting a prepared parameter sets in the format of a S7 data blocks (WLD file) in the SIMATIC manager

Remote tool for initial start-up, service and remote maintenance

### 355Remote

(German, English)  
355Remote can access the controller via Ethernet TCP/IP, Profibus-DP or MPI.

- Software for online and offline device and parameters configuration
- Automatic generation of a wiring diagram
- Online viewing of the control process
- Read-out and storage of values from the data logger and from alarm history
- Administration of parameter sets

## CompactConfig



## CompactRemote



## R6Konfig



## 355Config



## 355Remote



137 887  
147 787  
147 779



Z250i



Z270i



## Programming and additional cables

serve programming of transmitters on a PC if the respective software is available

### Customer benefit

- Programming is possible at the transmitter with or without a power supply connection
- Programming of transmitters in standard and Ex design

Article No.	Description	VK616 V611	V608 V624 V606	VC603 V604 V644	TV809 (NEx)	TV809 (EX)	A200R
137 887	Programming cable PK610 (Ex)	•	•				
147 787	Programming cable PRKAB 600 (Ex)			•		•	
147 779	Programming cable PRKAB 560 (NEx)				•		
980 179	Extension cable SUB D 9pol. male/female						•
141 440	Additional cable	•					
141 416	Additional cable		•				
988 058	Additional cable			•			
143 587	Additional cable				•	•	

## USB 2500 / USB 2700

IR/USB Adapter for the controller R2500 and R2700. To use the configuration tool CompactConfig you require either the IR adapter IR/USB 2500 (Z250i) for R2500 or IR/USB 2700 (Z270i) for R2700.

Article No.	Description
Z250i	IR/USB adapter for R2500
Z270i	IR/USB adapter for R2700

## Converter from USB to RS485

USB to RS485, with galvanic isolation, for SINEAX V604s, VR660 or ALPUS.

Article No.	Description
163 189	USB/RS485 converter

## Converter from USB to RS232-TT (Config Box)

USB to RS232, with galvanic isolation.

Article No.	Description
162 917	USB/RS232-TTL converter Config Box

# Camille Bauer

## Software and accessories

### Temperature sensors

in standard and customised designs and with process connections for all industries

#### Resistance thermometers

- Head sensor
- Cable sensor
- Sheathed sensor
- Room sensor

#### Thermocouples

- Head sensor
- Cable sensor
- High temperature TC
- Sheathed TC
- Glass bath TC

#### Precision sensors

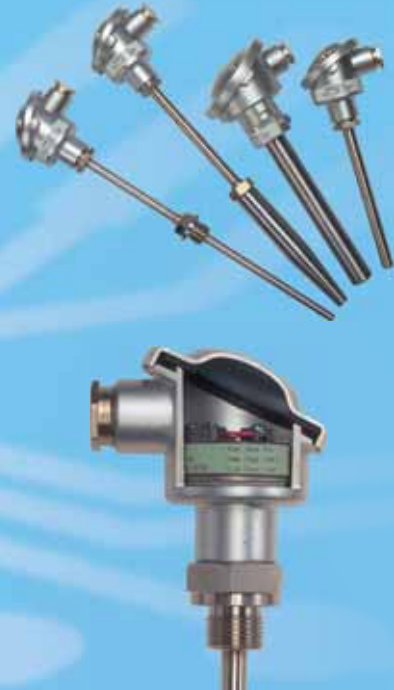
- Pt10, Pt25, Pt100
- Miniature fixpoint temperature measurement systems

#### Components and accessories

- Flanges
- Turned parts
- Threaded bushings
- Screw joints
- Connecting heads
- Sockets

More detailed information upon request

### GMCTherm



## EURAX BT901



### 19" Assembly rack

for plug-in cards in European format



#### Customer benefit

- Available in Ex and non-Ex design
- Ex and non-Ex devices may be combined in one assembly rack
- Solder, wire-wrap or screw terminals
- Customised completely or partly assembled rack

#### Technical data

Power supply: 24–60 V AC/DC or 85–230 V AC/DC

# Camille Bauer

## Products for heavy current engineering

### Display units

Multifunctional display units are used to monitor energy consumption in distribution facilities. They can replace numerous analogue indicators, have an integrated energy counter and partly network analysis functions. They may be connected to a PLC or control system via I/Os or bus connections (Modbus, Profibus, Ethernet, LON). Network configuration and connection parameters can be conveniently set via buttons or via PC software. Some versions permit customised parameterising of display data, e.g. the suppression of displays, priority displays or changing displays with interval control.

### Transducers

The properties of multifunctional heavy current transducers can be completely programmed. They measure any variable of an electric network. The application (network configuration) and the behaviour of the analogue and digital outputs can be set by PC software without hardware variants. Measured value acquisition during operation is also supported via the programming or bus interface (Modbus, Profibus, Ethernet or LON). Programmable transducers are more resistant to interference in comparison with indicators and designed for more dynamic behaviour of the input signals.

Unifunctional transducers are of an analogue design. They are customised to the required measuring task during the manufacturing process. The DC signal proportionate to the measured value can be used for visualising via analogue indicators or further PLC processing. Converters are available for all basic variables in the electric network.

### Power quality

The quality of energy available in electric networks is determined by the consumers connected. Their power consumption is often non-linear and influences the network quality negatively. This may impair the smooth operation of sensitive consumers (e.g. computers). The quality of network voltage which a power supplier has to provide is thus determined by international standards. But also energy consumers and equipment manufacturers must limit their feedback to the power system. For monitoring the compliance with standard values devices for temporary, mobile use and firm installation in the facility part to be monitored are available.

### Energy management

Acquisition, analysis and optimising of the energy consumption and its allocation to generating cost centres is one of the central tasks of any company. To perceive the same on every level, we offer different product groups:

- Active power meters (calibrateable)
- Summation stations. To record meter readings centrally via pulse inputs or via LON bus.
- Peak load optimisers: To avoid power peaks the current energy requirement is determined and optimised by direct consumer control.
- Energy Control System (ECS): The solution for energy data acquisition in the industrial environment. This system provides the data for cost centre allocation and the basis for consumer and load optimising.





# Camille Bauer Products for angular position engineering



## Angular position transducers

The angular position transmitters from Camille Bauer are precision instruments and serve the acquisition of angular position and rotation, processing and the provision of measured values as electric output signals for the downstream device. They convert the angular position of a shaft into a load-independent direct current signal, proportional to the angular position.

The robust design makes the angular position transmitters of the KINAX WT7xx series particularly suited to applications in rough environments. The products are used in many areas, preferably in large machine construction, industrial plants, power plant construction, ship and offshore facilities, crane vehicles, large transport vehicles, dredger and drilling equipment.

The compact design of the KINAX to be installed or for surface mounting makes the angular position transmitters particularly suited to the installation in or mounting on devices and apparatuses. The products are used in many applications, e.g. railway engineering, industrial plants, ship building, power plant construction and gate positions.

### Main features

- Simple connection technology with 2, 3, 4 wire or plug connector M12
- Absolute angular position is immediately available after switch on
- Non-mechanical abrasion, low annual maintenance
- Vibration and shock-resistant
- Versions non-programmable and programmable
- Analogue or digital output signals in CANopen and SSI with M12-plug connector
- Available in type of protection "Intrinsic safety" EEx ia IIC T6

## Inclination transducers

The inclination transmitter from Camille Bauer converts the tilt angle into a direct current signal, proportional to the angle. The output signal is either available as an analog signal in form of a current change or digitally with a CANopen or SSI bus interface.

Magnetostrictive angular position transmitters are extremely robust measuring systems without a shaft stop, fully hermetically encapsulated and capable of measuring contactless the angular position of a permanent magnet, which is attached to the pendulum system.

Tilt angle values of a platform e.g. on cranes, heavy-duty vehicles, excavators and drilling machines, ships and offshore facilities stand for important measuring data as a part of the safety and control system of that type of machinery. Angular measurement, for instance for equipment levelling is performed in such cases.

For acquisition the angular position of a crane jib, lateral inclination of a vehicle, orientation of a lifting platform, weir trap or comparable facilities, alignment of solar panels or concave mirrors the KINAX N702 can also be used.

### Main features

- Simple connection with plug connector M12
- Absolute angular position is immediately available after switch on
- Versions non-programmable and programmable
- Analogue or digital output signals in CANopen and SSI with M12-plug connector

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